AUGUST 24, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Electromachining Methods Tackle Production Jobs

Two toolroom innovations, electrospark and electrolytic machining, have earned production line status. Process improvements (like a substantial boost in electrode life) have made them economically feasible. Electrolytic machining is proving itself on hard to work steel alloys. Spark machining is moving into diesinking. Will the methods handle your problem jobs? . . . Page 80

Most Users' Steel Stocks Will Last Till Early October, Recount Shows

McDonald Now Rides High with USW

What Mitchell's Report on the Steel Dispute Will Mean to Negotiations

Controlling Business Car Expenses

Heat Treating Equipment Orders Up

Castings Will Take on Muscle Jobs

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METALWORKING OUTLOOK
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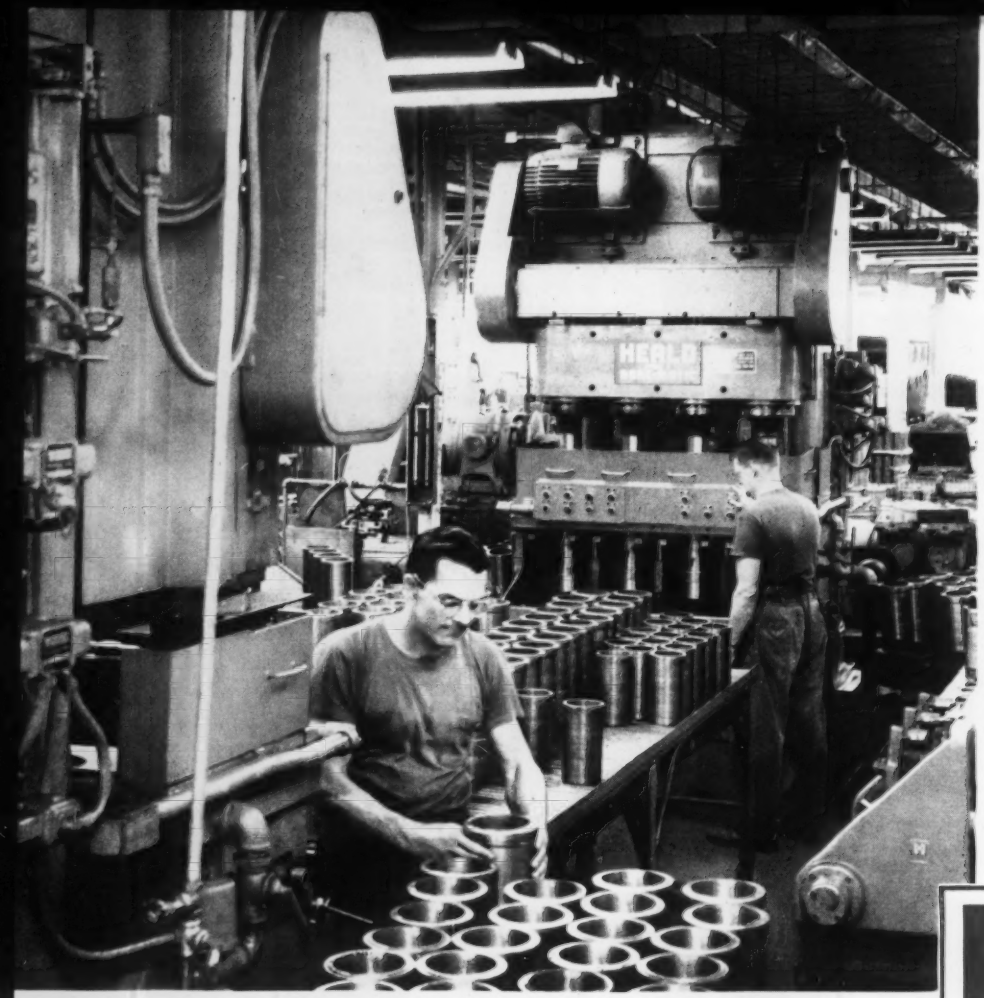

Two Heald Model S Bore-Matics installed in diesel engine plant for rough and finish boring cast iron cylinder liners. Unit in foreground performs the roughing operation, with capacity of up to ¼" of stock removal on four parts at a time, followed by finish boring on identical machine at the right.

HEALD

KING-SIZE BORE-MATICS

rough and finish bore diesel cylinder liners FOUR AT A TIME

HEAVY-DUTY roughing and precision finish boring are the dual functions of the two Heald Model S Bore-Matics shown above. Installed in a large diesel engine plant, these huge, 40,000-pound machines are identical except for tooling — each handling four large cast iron cylinder liners at a time.

One machine, used for the roughing operation, is capable of removing a full quarter inch of stock — the other is used for finish boring to close tolerances for size and concentricity. Each four-station machine is equipped with a hydraulic clamping fixture and operates on a fully automatic push-button-controlled cycle. Total cycle time is 266 seconds on the roughing operation, with a net production of approximately 40 parts per hour.

These big vertical Bore-Matics are further evidence of Heald's ability to handle all phases of a machining operation from rough casting to finished part on any size work.

It PAYS to come to Heald

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

This Week in STEEL

The Metalworking Weekly

August 24, 1959 Vol. 145—No. 8

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED AUG. 15	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	114†	117	138	139

†Preliminary.

The decline of the industrial production index in the last two weeks has been limited almost entirely to auto production, which is being cut back for model changeovers. Otherwise, the economy in general is holding up well as the steel strike enters its sixth week.

Details on Page 67

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED AUG. 22	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	30,000*	72,745†	124,446	25,918

*Estimated. †Preliminary.

The last of the 1959 models are being produced this week, as well as the first of the 1960s. Studebaker-Packard, Chrysler Corp., and American Motors Corp. are in the van, followed by General Motors Corp. and Ford Motor Co.

Details on Page 64

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED AUG. 23	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	340*	335	365	1,690
Index (1947-49=100)	21.2*	20.9	22.7	105.2
Percentage of capacity	12*	11.8	12.9	62.6

*Estimated by STEEL; comparative figures reported by AISI.

Increasing pressure for tonnage is being applied on mills still operating as fabricators watch their reserves dwindle. Concern will mount steeply late next month when consumption begins its seasonal spurt.

Details on Page 114

STEEL SCRAP PRICE COMPOSITE

	AUG. 19	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$38.33	$38.33	$38.67	$41.33

STEEL's composite on No. 1 heavy melting holds at $38.33 in a dull market. Export demand and prospects for a heavy movement to domestic mills as soon as the strike is settled are chief market supports.

Details on Page 126

FINISHED STEEL PRICE INDEX

	AUG. 18	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	186.5

Advances of $7 to $10 a ton on imported steel have been posted in the Birmingham district, but delivered prices are still well below domestic mill quotations. Most consumers are reluctant to place large orders.

Details on Page 115

FINISH-GRINDING a 22-ton hardened steel roll for rolling aluminum. Overall length: 231 in. Diameter 34¼ in.

The finish must be perfect on this hardened steel roll

This Bethlehem machinist is finish-grinding the surface of this roll with utmost care. His intense concentration is nothing unusual; every Bethlehem roll is ground and polished with such care. When he completes this operation, the customer can be confident his specifications on finish have been met *exactly*.

Bethlehem pays the same careful attention to meeting customer specifications on hardness and dimensions. Every step in making a forged roll—from melting the steel to inspecting the finished product—is carefully checked, and then, just as carefully, double-checked. No roll is released until every technician on the job is completely satisfied.

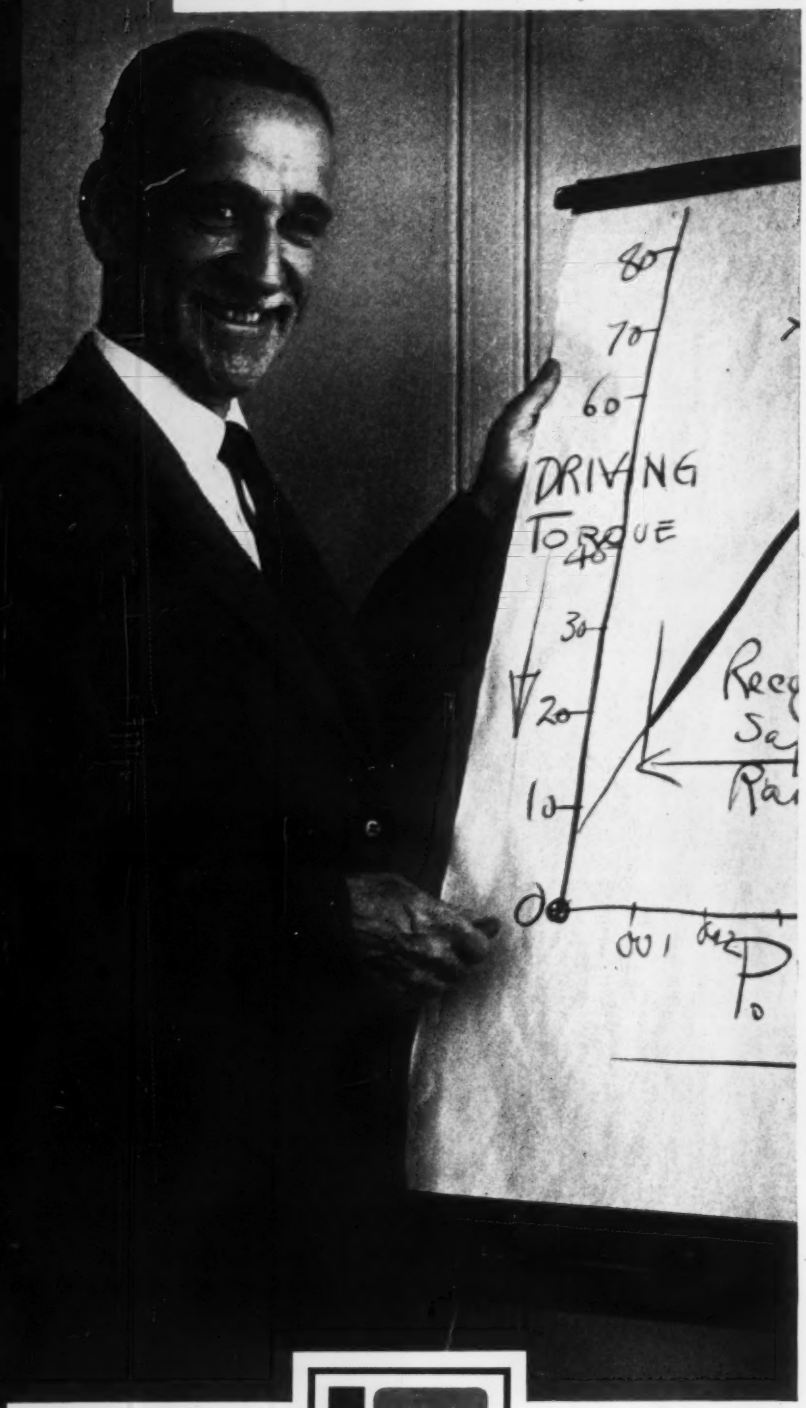
When next in the market for forged rolls, why not check with us first? We make them in all sizes, and for every application: cold-rolling ferrous sheets and strip; running-down and finishing operations on copper and brass sheets; hot- and cold-rolling aluminum sheets; cold-rolling aluminum foil. Our prices and deliveries are fully competitive. Our nearest sales office can give you full details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

WILLIAM G. WALTERMIRE, *Chief Products Engineer, Lamson & Sessions, says...*



Your interest... and ours... is "assembled product cost"

Many fastener users think only in terms of unit price. Actually, labor costs of assembly are usually 3 to 4 times the price of the fastener itself.

Your job, and ours, is to find practical ways to cut your "cost of assembled product". To do this, we frequently hold meetings with purchasing personnel, design engineers, standards engineers, and quality control people at our customers' plants.

By means of charts and slides, we show how to simplify types and sizes of fasteners used, which reduces purchasing and inventory costs. We guide them in selection of thread classes to meet different material, tapping and assembly problems. We often suggest ways to improve strength and cut costs—by substituting a smaller high carbon fastener for a larger size, low carbon type. Or we may suggest redesign of a bolted assembly to use standard instead of special fasteners.

Take advantage of this no-charge L & S service. Call or write us for an analysis of *your* fastener problems.

L & S Fastener Engineering helps you "tighten up" on...

- **PURCHASING COSTS**
- **INSPECTION AND HANDLING COSTS**
- **ASSEMBLY COSTS**

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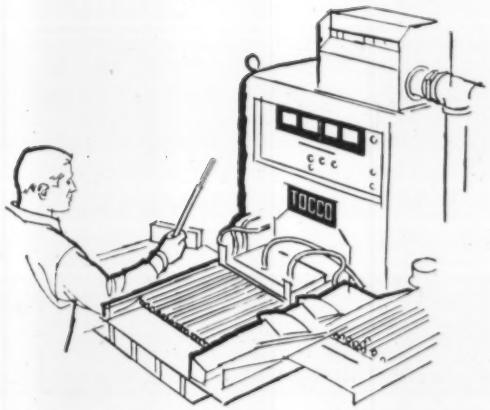
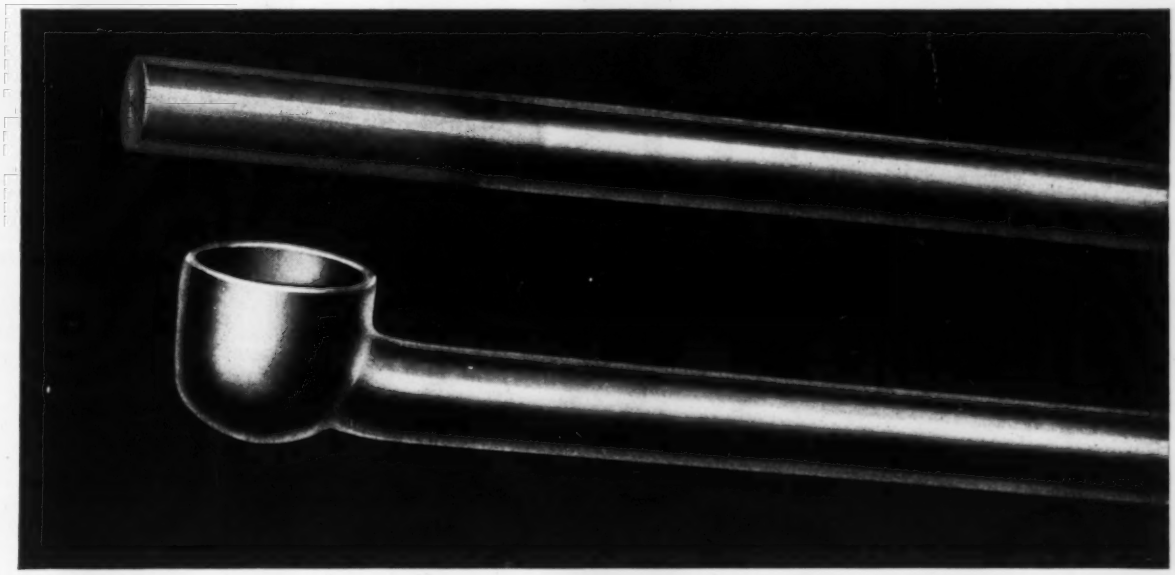
5000 TIEDEMAN ROAD · CLEVELAND, OHIO

Plants in Cleveland and Kent, Ohio · Chicago and Birmingham



Heating Costs Cut In Half

with TOCCO* *Induction Heating*



Engineers at Thompson Products Inc.'s Michigan Division recently changed from gas-fired furnaces to fully automatic TOCCO. Application: heating for forging of automotive tie rods. Result: a substantial reduction in direct labor costs, saving thousands of dollars a year on this heating for forging operation. *Annual savings actually amortize the cost of the TOCCO installation in about one year.*

The automotive tie rod shown here is only one of over 500 parts heated for forging in Thompson's new, modern forge plant. *Every one of these parts is heated with TOCCO equipment.*

If *your* manufacturing operations require heating for forging, heat treating, brazing, soldering or melting, it will pay you to investigate TOCCO as a sound method of increasing production and lowering costs.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. S-8, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Heating for Forging and Forming".

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new tracer from LeBlond!

REGAL TRACE

new principle, new design, new convenience, new price... as low as $2760!

Now, simply by adding Regal-Trace, you get all the advantages of tracer lathe production with your present LeBlond Regal and Dual Drive Lathes. Easy, fast, accurate—Regal-Trace gives your lathe low cost duplication of parts for high production turning. Prices begin as low as $2760 for the 13" Regal model.

Easy to use—Operates from easily prepared flat templates. Traces radii, stepped shafts, contoured faces, tapers, compound and spherical curves. Simple to set up. Can be installed in less than 15 minutes. Self-contained—only 4 major parts, all mounted on lathe. Hydraulic unit becomes an integral part of the machine (does not interfere with normal lathe operation). Tracer unit quickly replaces compound rest.

Fast and accurate—Locked-circuit hydraulic system produces exceptional responsiveness and precision. Regal-Trace will consistently duplicate part after part to accuracy of ± .0005". Feed rate of 75" per minute keeps up with speediest cuts. Fits any LeBlond Regal built since 1955, and all Dual Drives. Regal-Trace is the ideal lathe attachment for tool room or production turning. See your LeBlond Distributor or write today for complete information. Ask for Regal-Trace Bulletin.

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Cincinnati 8, Ohio

world's largest builder of a complete line of lathes for more than 72 years

LEBLOND of Cincinnati

STEEL
Servicenter

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

August 24, 1959

It's O.K. to Look, but . . .

Our office manager in Chicago, Miss Aleda Hagen, was leaving on a trip. Before her departure, she gave some general instructions to the men in the office. Joyce Money, the office receptionist, after hearing the advice, created this memorandum:

"**From:** Joyce Money
"**To:** All Male Personnel
"**Subject:** Female Office Personnel—
Treatment of:

"The species must be washed, dressed, combed, curled, painted, fed, and watered daily. When primping and other of these activities are observed in the office, it is best to ignore the proceedings, unless you have kind thoughts to convey. Under no circumstances should you criticize, disparage, or make fun of these rituals.

"Since the species is rather vain, as suggested above, it is open to flattery, blandishments, and praise.

"It reacts exceedingly well in an atmosphere of admiration. It will become quite tractable, even kittenish, if handled properly. However, it has an aversion to direct contact. Therefore, do not handle. Not only will handling ruffle its composure but could cause it to develop habits detrimental to its future usefulness. It is easily frightened by objects and occurrences not indigenous to its domain—trick snakes, pins on chairs, loud noises, and similar distractions are in this classification.

"It likes suggestions but not direct orders, and its favorite words are 'please,' 'thank you,' 'if you will,' 'when you have time,' among others. It must be let out for exercise each morning, noon, and afternoon (if possible). Any interference with these respites may turn it churlish.

"It dislikes being rushed or pressured, and will commonly retreat in injured silence if called upon to overperform.

"While its powers of organization may be highly developed, it is ill equipped for manipulating heavy boxes, repairing broken typewriters, hauling objects off tops of high cabinets, and should be given considerable assistance with these tasks. If you do not heed its pleas for help, it might turn up with injured fingers, dislocated vertebrae, and other disorders which make it quite useless for an indefinite period.

"All in all, it is best to speak softly, approach with caution, and treat with chocolates, and honeyed words as the occasion warrants."

O.K. bosses, how do you want to be treated?

STEEL Goes to School

"Your 'Facts and Figures of the Metalworking Industry' would be valuable to my class of 25 graduate students in production engineering and management," writes A. A. Ewald, captain, USAF, and assistant professor of management, Institute of Technology, Wright-Patterson Air Force Base, Ohio. "We would circulate and study the copies, thereby gaining a better understanding of your industry."

The copies were sent.

The Answer to End Answers

Bob Huber, our peripatetic machine tool editor, says he's finally found the answer to the question which comes up most often during his visits to metalworking plants. The question: "How long is this (name unspecified) strike going to last?" Bob heard this formula answer in Chicago: "Well, first you jot down the number of the moon's phases remaining until yearend. (That puts us on a scientific footing right off.)"

If the questioner doesn't tumble at that point, Bob says the formula continues with: "Add the number of letters in the name of the union; subtract your age; bring in number of aspirin sold annually in the U. S.; talk with bartenders; deduct U. S. tax on alcoholic beverages; then, as a double check, ask your wife. If she's related to the president of the union involved, and he talks in his sleep, you have a chance."

Ohio Valley Revisited

"In your July 20 article, 'Ohio Valley Bids to Be Another Ruhr,' you stated that there is no new facility of any size between Marietta and Steubenville (Ohio) except the Ormet plant," writes R. L. Cunningham, president, Ohio Ferro-Alloys Corp., Canton, Ohio.

He continues: "We operate a large electric furnace plant at Philo, Ohio, about 60 miles north of Marietta on the Muskingum River. This plant produces a full line of ferroalloys.

"In 1952, we built and started operating a large electric furnace plant at Brilliant, Ohio, on the Ohio River between Steubenville and Wheeling (W. Va.). It produces silicon and chrome alloys.

"In 1958, we completed and started a new ferroalloy plant about six miles north of the Ormet plant, on the Ohio River. It is one of the most

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for profitable mass production

High speed, YODER Cold Roll-Forming machines are the most economical method for mass producing structural or ornamental shapes. One machine with one operator can form up to 40,000 feet of shapes per day. Even on a part-time basis, a YODER Cold Roll-Forming machine can prove to be a profitable investment.

YODER flexibility works for you too, curving, coiling, ring forming, multiple roll-forming and embossing—on a wide variety of metals—can be incorporated into your production line. Practical, YODER-engineered design minimizes maintenance and downtime... assures uniformity, accuracy and reliability of your end product.

In addition to Roll-Forming machinery, YODER also makes a full line of Rotary Slitting equipment, Pipe and Tube mills. Send for the fully descriptive Cold Roll-Forming Book.

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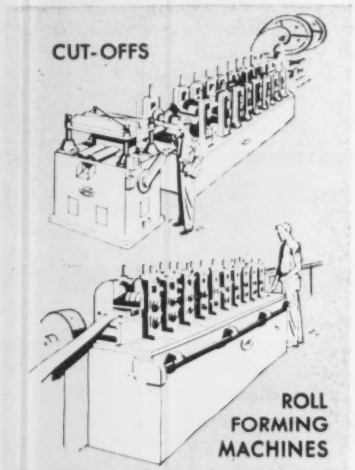

ENGINEERING YODER MANUFACTURING
COLD ROLL
FORMING
MACHINES

modern alloy plants in the U. S. today."

Here's [sic] Onery Ed

"I can't spell well myself—but editors and stenographers really should," writes R. C. Hollingshead, Hanford Atomic Products Operation, General Electric Co., Richland, Wash. He continues: "The copy of Webster available to me lists no such word as 'Onery' (Servicenter, July 20, p. 5). I suspect you meant 'Ornery.'"

Mr. Hollingshead refers to the spelling of the name Onery Ed, the STEEL editor who takes on all the cantankerous, cussed jobs that Ed Service won't handle. The construction is intentional. In giving the name character, we dropped a character. The name was submitted in that form (Onery Ed's Corner) and we toyed with making it "Onry," but that sounded too much like something in a horse opera. Our concession to the niceties of Americanese was manifest in printing "onery," twice, within quotation marks to denote that we knew the spelling was incorrect.

Webster's New Collegiate Dictionary says: "Quotation marks . . . are used to enclose . . . coined words . . . or the like, for which the writer offers a slight apology. . ."

Reflect a bit on the phrase, "coined words." Maybe that should be "corned words," but we'll stick with Onery Ed. He's a pretty handy guy.

Will He Jump the Fence?

No one knows if whitecollar employees will become union members until the ballots have been counted. But, does it have to come to a vote?

Associate Editor Brian Wilson, in New York, talked with supervisors, company officials, and heads of industrial associations to find out what you can do for nonunion employees and how you can keep them on management's side of the fence.

One supervisor summed it up simply: "We all seek three things: Security, recognition, and an opportunity to advance." He added that whitecollarites want to be kept informed not only about things which affect them directly, but they want officials to tell them about company plans and changes in policies.

Brian capped his interviews by finding out what unions plan to do in organizing whitecollarites. The article, appearing next week, will give you insights to employees' needs and wants—and tips on how you can fill them.

Get new-forging performance at 1/3 the cost from ERIE FOUNDRY REBUILDING SERVICE

Here at the Erie Foundry Rebuilding "Hospital", we disassemble and inspect your forging hammer, remachine worn surfaces, true bearings, replace broken parts, repair cracked parts. Once the hammer is reassembled, tested and put back in operation, it'll be as spry and sound as a new machine—but at one-third the cost!

Stands to reason that the leaders in forge manufacture for over 60 years should be the best source for forge repair.

Regardless of who made it, or how badly it's cracked, broken or worn, your forging hammer will recover most quickly at Erie Foundry's Rebuilding "Hospital". Write for the complete story.

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THE WORLD'S GREATEST NAME
IN FORGING SINCE 1895

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ERIE 2, PA.

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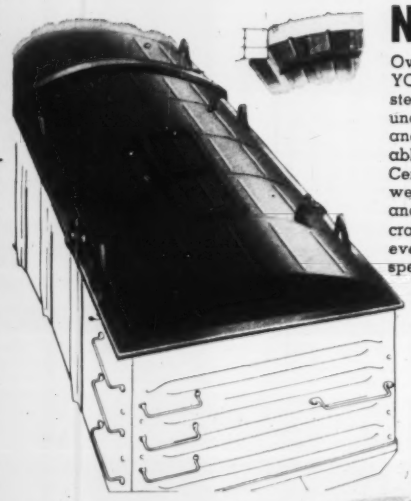
NEW *DAMAGE CONTROL DEVICES* by

for Railroads and Shippers

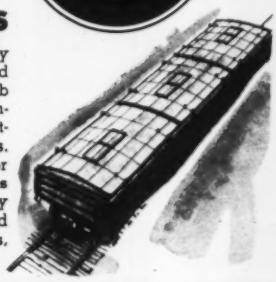
- LOWER SHIPPING COSTS
- CUT DAMAGED SHIPMENTS
- SAVE MAN-HOURS

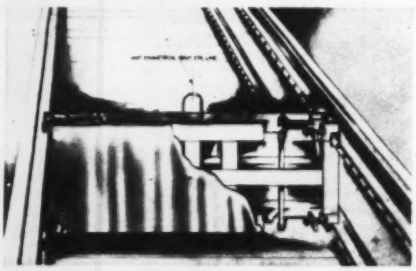
YOCAR

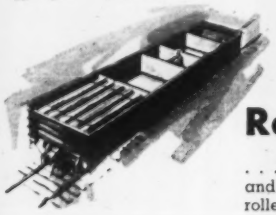


NEW Gondola Roofs

Over-all product costs are **important**—that's why YOCAR roofs are a must for your road. Beaded steel welded over YOCAR's **exclusive** web underconstruction insures warp-free performance; extra months of revenue service. Adjustable roof heights meet A.I.S.I. 48" standards. Center section over-laps end sections; greater weather protection for steel bars, sheets, plates and tubing. Roofs are quickly removed by cranes using "C" hooks, slings, chains and even sheet lifters. Manway doors, catwalks, special heights optional.

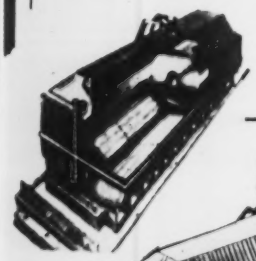


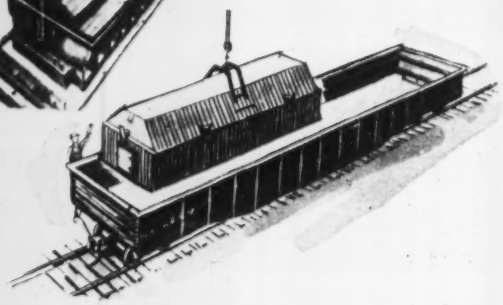




NEW . . RoLLoK Movable Bulkheads

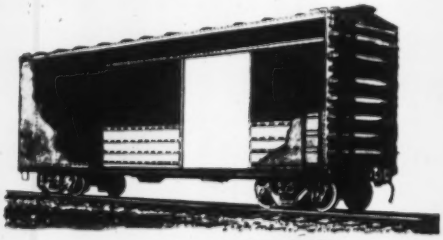
. . . cut installation time in half with new "Zee"-section tracks at top and bottom of car walls; bulkhead positions easily on case-hardened rollers; over-sized locking pins allow for car wall distortion . . . swivel crank operates locking pins quickly and safely. Meets A.I.S.I. standards . . . steel or wood facings available . . . bulkheads are in car sets to meet any requirement.





NEW Gondola Hoods

For your coil shipping needs . . . YOCAR's Hi-Side Hoods to fit all existing skid cars or YOCAR's new Shock-Spring Coil Skid and Low Walled Hood. Features: tighter fits; handles easier, even in low height-clearances; deeper coil well for positive cradling. New cross-member retainer bar locks coils securely for maximum protection.



NEW *ECONO-GUARD*

. . . low-cost steel anchor-wall liners add years to car wall life . . . provides greater damage protection to shipments with over 200 "Safe-Cargo" anchoring pins. Ask about SAFE-CARGO anchor belt rails for PIGGY-BACK trailers.

SEND FOR NEW CATALOG TODAY!

VISIT US AT THE A. R. S. A. CONVENTION, BOOTH 170, SEPT. 20 - 23, HOTEL SHERMAN, CHICAGO

YOCAR

YOUNGSTOWN STEEL CAR CORP., NILES, OHIO

Quality . . . the best economy of all

He's mopping up the mess for the last time

At a leading aircraft research center, high-frequency vibration caused severe oil leakage from hydraulic lines servicing a huge wind tunnel. Many man-hours each month were wasted cleaning up the basement floor underneath, even though drip pans were used extensively.

Now, after a change to a Suntac oil, the vibration-caused leakage has been reduced to a point where "mop-up" is not needed. Hydraulic-fluid consumption has been cut by 4000 gallons a year. That's economy! That's Sun quality—the best economy of all.

If your plant is troubled with a leaky system, a Suntac antileak hydraulic oil can save you money, too. Ask your Sun representative to show you the Suntac desk-top demonstration, or write direct to SUN OIL COMPANY, *Philadelphia 3, Pa., Dept. S-8. In Canada: Sun Oil Company Limited, Toronto and Montreal.*

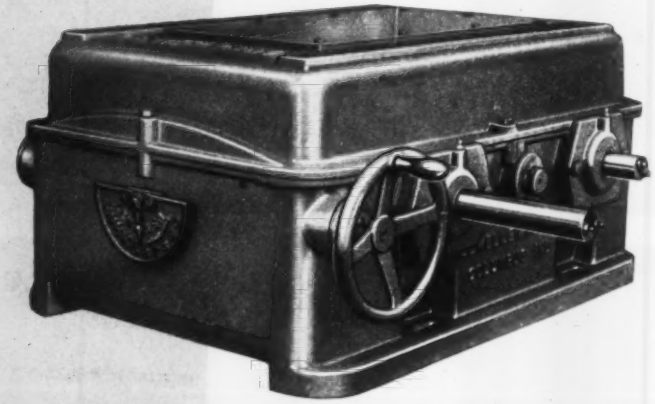
SUNOCO

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

THERE IS A

LEWELLEN

VARIABLE-SPEED TRANSMISSION TO MEET YOUR NEED



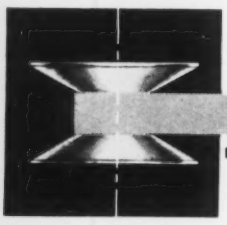
SUSTAINED PERFORMANCE — Twenty years of operation, even under adverse conditions, is not uncommon.

WIDE SPEED RANGES — Infinitely adjustable speeds are available in ranges as wide as 20:1.

FINE SPEED ADJUSTMENTS — Speeds may be adjustable—and stable—to fractional rpm's.

NON-LINEAR LOADS — H.P. decreases only by $\sqrt{\text{speed range}}$ while torque increases by $\sqrt{\text{speed range}}$, as output speed decreases.

ALTERED STARTING SPEEDS — Speed setting may be adjustable either running or not running.



LEWELLEN

Manufacturing Company, Columbus, Indiana

Distributors in All Industrial Areas. In Canada—Peerless Engineering Sales, Ltd., Toronto-Montreal

CALENDAR
OF MEETINGS

Aug. 31-Sept. 2, Metallurgical Society of AIME: Institute of Metals Division's conference on semiconductors, Statler-Hilton Hotel, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, American Mining Congress: Metal mining and industrial minerals convention, Denver. Congress' address: Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

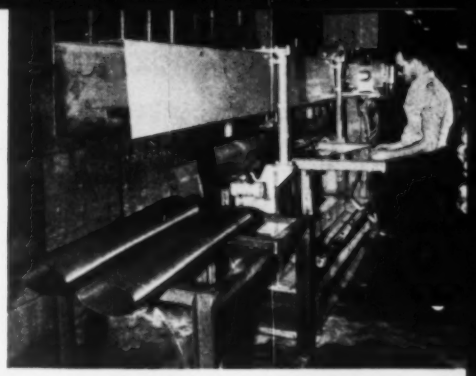
Sept. 16-18, National Industrial Conference Board: Marketing conference, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 17-18, American Society of Mechanical Engineers: Engineering management conference, Statler-Hilton Hotel, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Sept. 18, Malleable Founders' Society: Industry meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Sept. 21-22, Steel Founders' Society of America: Fall meeting, Homestead Hotel, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Sept. 21-23, American Management Association: Personnel conference, Astor Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.



At Mackenzie Muffler, *workman is fabricating oval muffler shells from Youngstown Cold-Rolled Steel Sheets*

Accent on Excellence

Youngstown cold-rolled sheets

Quieting today's 300-horsepower automobile engines to a barely audible whisper, are efficient mufflers made by Mackenzie Muffler Company of Youngstown, Ohio, that provide long-lasting service while undergoing the severest of climatic and operating conditions.

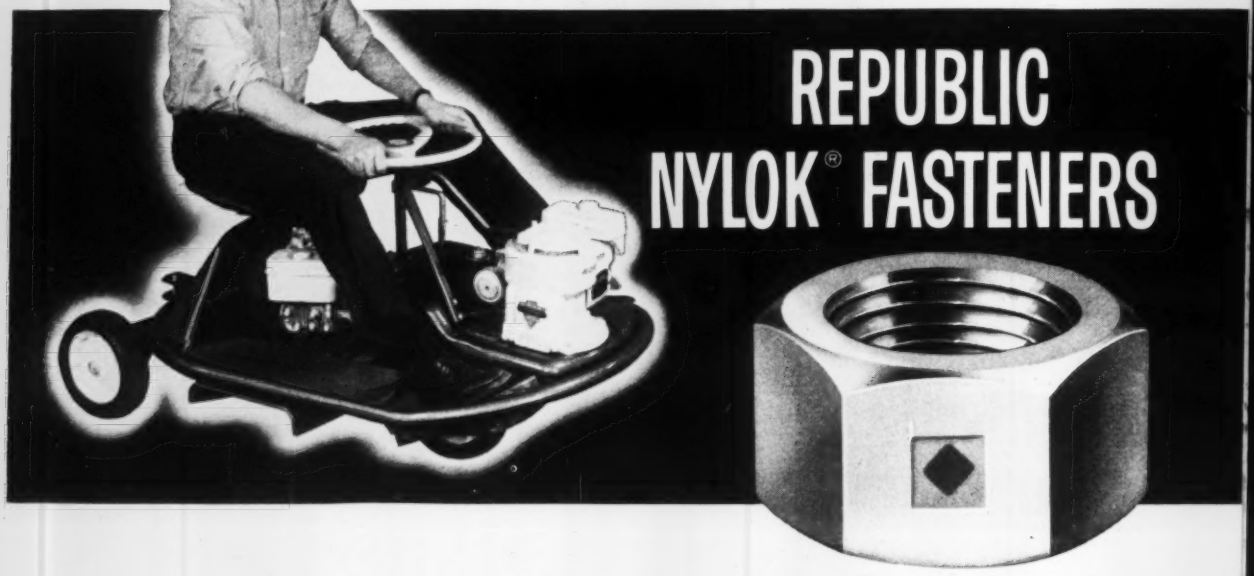
Mackenzie Mufflers, fabricated from shells of Youngstown Cold-Rolled Steel and internal components of Youngstown mechanical tubing, are found quietly at work under the flashy empennage of today's finest automobiles.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

Where secure holding power is needed most...



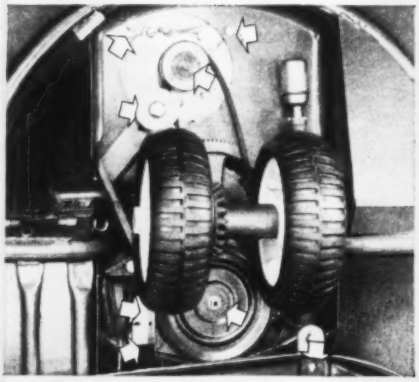
Users from coast to coast know about the quality construction of Roberton Twin Power Riding Mowers, made by Roberton Manufacturing Company, Chicago, Illinois.

Efficient riding mowers like these, constantly used to cut grasses of varying thickness and height, are subject to intense vibration. Yet their *two* power units are firmly held in place for long, dependable service by a total of 44 Republic Nylok Fasteners.

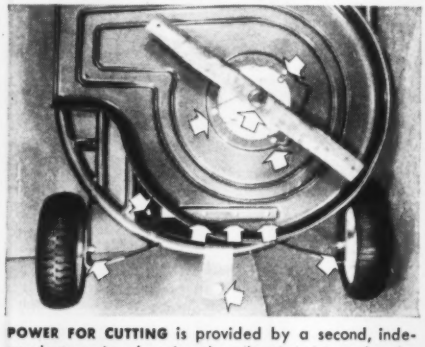
Republic Nylok Fasteners have a special nylon insert that assures positive locking at any position, even under severe shock, vibration, or tension. When the fastener is assembled, this nylon plug exerts pressure in a lateral direction, preventing all play, and utilizing the metal-to-metal contact of the opposing threads for locking.

Republic Nylok Fasteners provide maximum holding power under all conditions, whether seated or not; and they can be used repeatedly. One of their unique advantages is the "plastic memory" of the nylon plug—the tendency of the nylon to recover its original shape after assembly. This "growth" into the threads actually results in a tighter locking action, after a period of time, than when the fastener was first assembled.

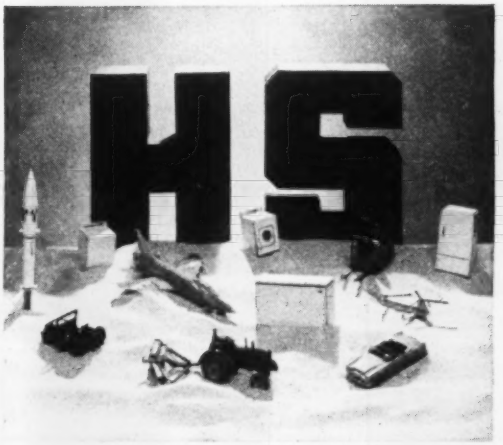
The nylon insert is unaffected by age or cold, has high resistance to heat, and very low moisture-absorption rate. These are but a few of the reasons why Roberton Manufacturing Company uses Republic Nylok Fasteners in its advanced line of power mowers. Advantages like these can pay dividends in *your* application, too. For full information, contact your Republic representative, or mail coupon.



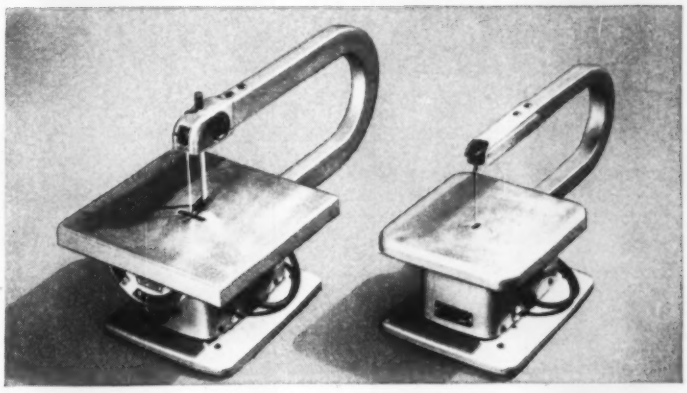
DRIVE UNIT, which furnishes motive power for Roberton Mower is securely held in place by Republic Nylok Fasteners as indicated by arrows. Engine remains tight against base even after years of hard service.



POWER FOR CUTTING is provided by a second, independent engine. Imagine the vibration set up by the swift-moving blade shown. Yet Republic Nylok Fasteners hold engine, wheels, and other parts, firmly in place.



REPUBLIC'S NEW HIGH STRENGTH POWDER, Type HS6460, opens the way to new markets for new applications using sinterings for highly stressed parts. Type HS6460 can be used with existing operating equipment. It provides a minimum tensile strength of 60,000 psi at 6.4 density as sintered, and 100,000 psi heat treated. Type HS6460 maintains its dimensional characteristics after sintering—less than .004 inches per inch shrinkage from die size at 6.4 density. Available in production quantities up to and including 12 tons, or in multiples thereof. Mail coupon for technical data sheet on Type HS6460 Powder.



EASY, EFFECTIVE FABRICATION is a characteristic of Republic Galvannealed Steel Sheets. Severe brake forming, shown above as done by Fogel Refrigerator Company, Philadelphia, does not affect their corrosion-resistant, paint-adhering qualities. Republic Galvannealed Sheets readily take shearing, punching, spot welding, and many other fabricating operations. Mail coupon for more facts.

SAVINGS IN A KEY PART are realized by Syncro Corporation, Oxford, Michigan, by using Republic ELECTRUNITE® Mechanical Tubing in the manufacture of jigsaws. Previously they used a casting for the blade-yoke, which requires a severe bend. ELECTRUNITE Square Tubing was recommended for one model, rectangular tubing for the other. Results: reduction in weight of the blade-yoke, and improvement in appearance of the product, with savings in time, materials, assembly, and shipping costs. For more information mail coupon below.

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Please send additional information on the following:

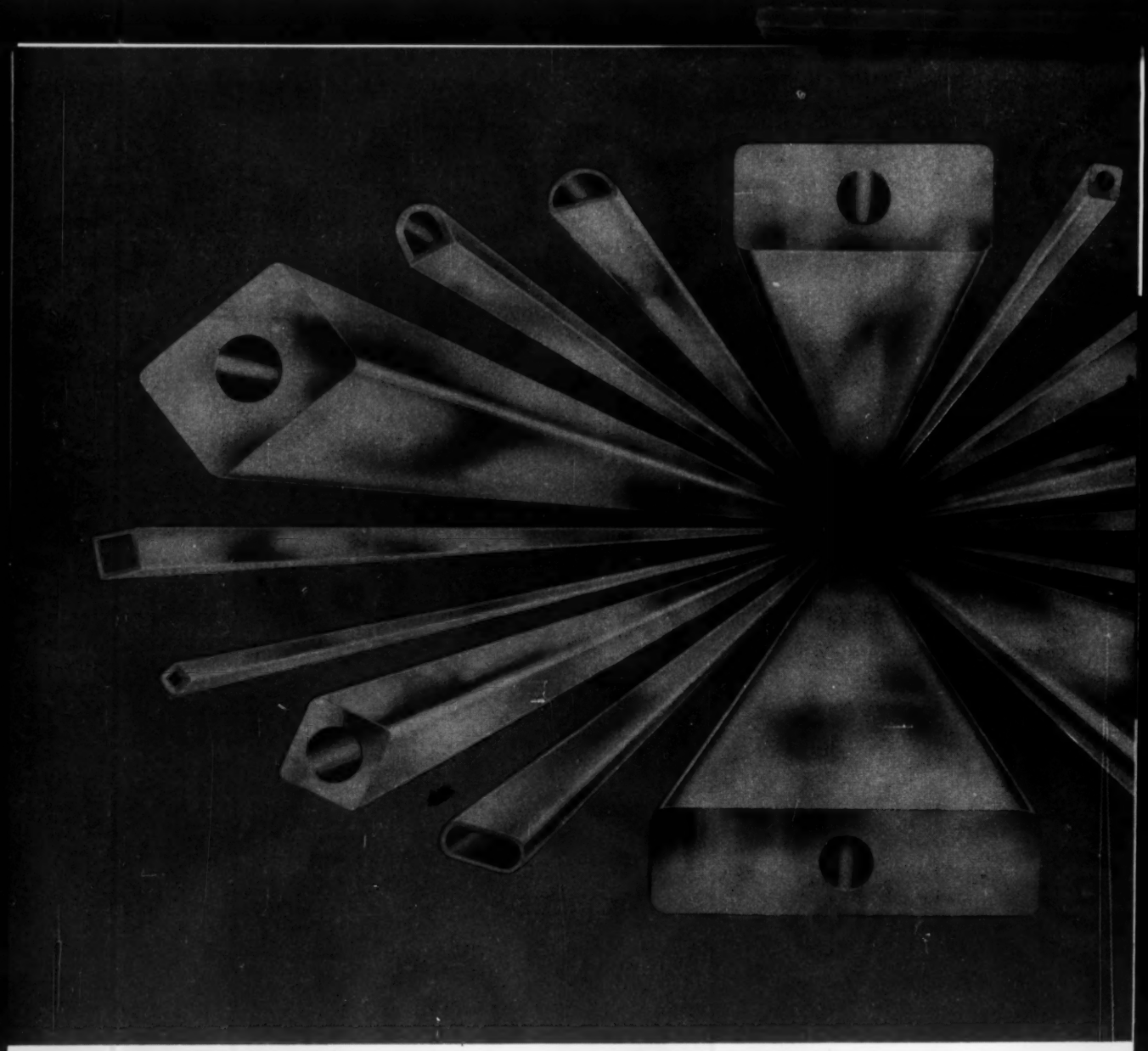
☐ Nylok Fasteners ☐ Galvannealed Sheets
☐ Type HS6460 Powder
☐ ELECTRUNITE Mechanical Tubing

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____



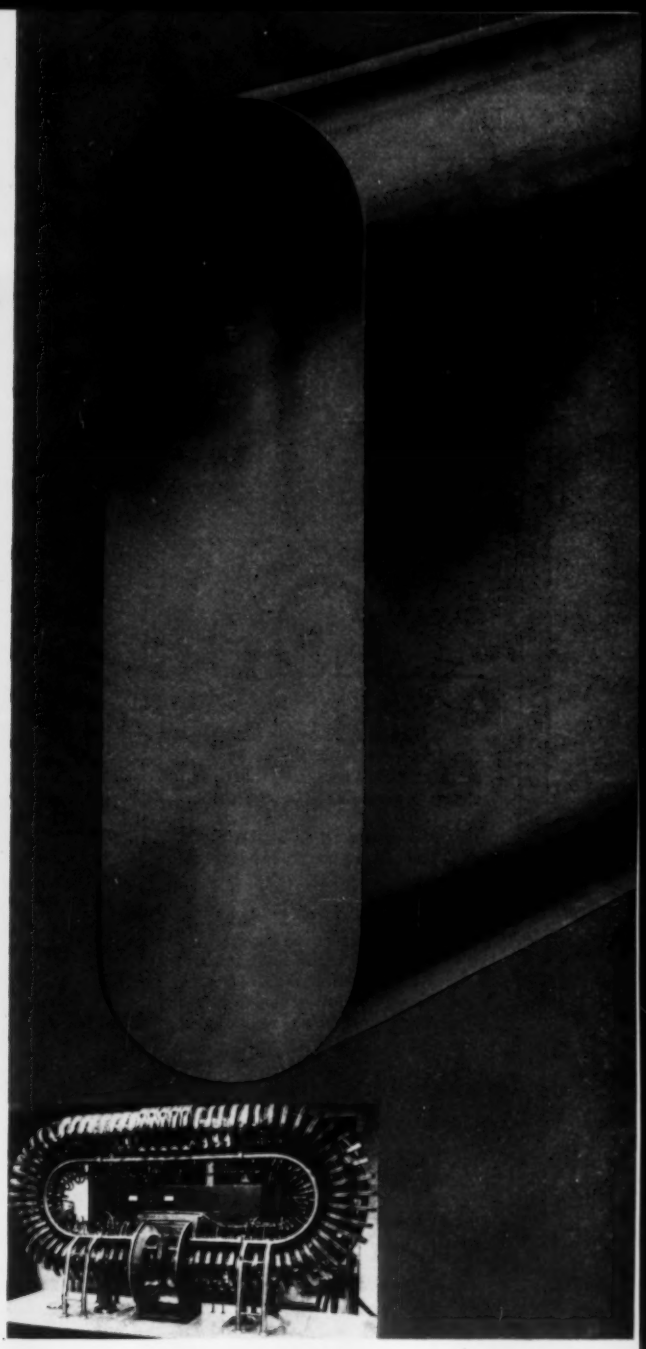
THE SHAPE OF THINGS TO COME WITH ANACONDA

Fluid-cooled copper conductors. The growing need for compact electrical assemblies which can handle high current densities is leading to an ever-increasing variety of hollow, fluid-cooled copper conductors. The samples shown full size above give some idea of the range of sizes and shapes produced by The American Brass Company.

Nuclear physics magnets are, perhaps, the most spectacular applications of fluid-cooled conductors. These hollow conductors range from tube .182″ square O.D. x .083″ square I.D. to heavy rectangular bars with a round core for water cooling.

Industrial applications. The use of fluid-cooled conductors is growing rapidly in large electrical equipment. Generator output can be greatly increased, without increasing frame size, by cooling stator and rotor bars. Fluid-cooled conductors are being used in heat sinks for rectifiers and induction furnace coils. Another interesting use is in compact water-cooled windings needed to provide very high flux densities in, for example, the ceramic magnet manufacturing process. These "solenoids" are being built for applications in which the current range is from a few hundred to about 2000 amperes.

Technical assistance. Whatever your problem—liquid-cooled field coils, rotor bars or a special-shape tubular conductor—technical specialists at The American Brass Company can help you work out the size and shape best adapted to your needs. See your American Brass representative or write: The American Brass Company, Waterbury 20, Conn. In Canada write: Anaconda American Brass Ltd., New Toronto, Ont. 5942



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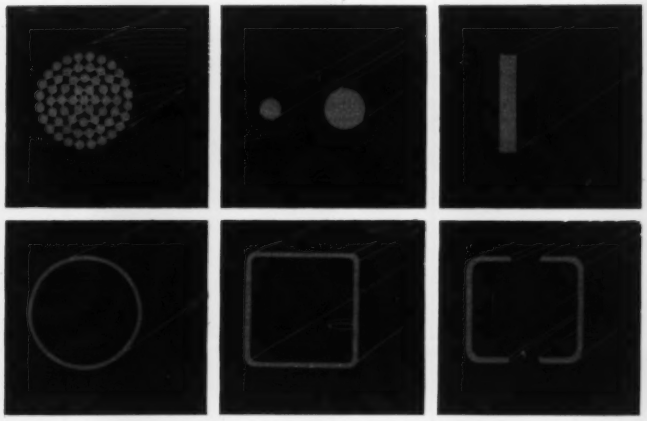

Standard Anaconda copper bus conductor shapes.

200,000 KW AT 750 VOLTS is maximum peak rating of twelve d-c generators providing power for the confining field coils in C Stellarator being built in the new fusion research facility at Princeton University. This power is needed to establish the maximum 50,000-gauss magnetic field, forming the walls around the reaction aimed at reaching 100 million degrees. A.E.C. demonstration model above shows one form of the Stellarator tube that has been considered. The big copper bus (top), 9 square inches in section and silver plated, will carry the tremendous power from the generators to the coils around the Stellarator tube. The American Brass Company has furnished the mile of bus required for the job to specifications of the Allis-Chalmers Manufacturing Co., Milwaukee, Wisc., which is assisting in the design and building of the C Stellarator.

ANACONDA®

ELECTRICAL COPPER PRODUCTS

Made by The American Brass Company

TMI TUBING TIP:

Get Those Good Ideas "Out" of Storage

'Way up front on the administrative level or deep in the development stage, good ideas have no right to go into storage because of small tubing problems.

We've made it a TMI specialty to think them out of trouble and into successful production fast.

If it takes the most involved testing formula to accomplish our goal . . . we have it in full experienced operation: electronic, ultrasonic, X-ray, pressure, bend, tensile micro-visual and classified! One of them or all of them . . . always at your service at TMI.

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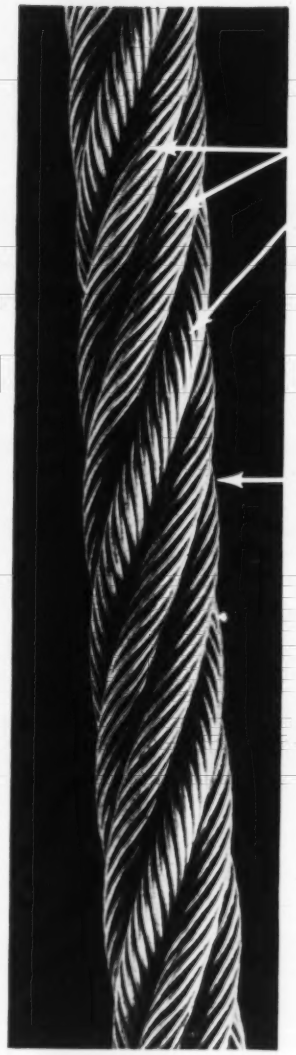

Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristics.

Heavier outside wires in each strand have greater resistance to abrasion.

"...and it has a much longer life"

GASKILL CONSTRUCTION COMPANY

The above quote is one of the things that Gaskill Construction Company says about the new Roebling Herringbone* Wire Rope. There are further quotes: ". . . We, after giving your Herringbone cable a great deal of use, find that it is far superior to any other cable and it is much more economical."

These are *user* statements about the newest design development in wire rope in many years. Herringbone is the regular lay and Lang lay wire rope. It is two-ropes-in-one rope, with the best features of each in combination. It has been used, with the same success quoted here, on a wide variety of machines as well as on tough hoisting jobs. Its potential is virtually unlimited wherever all-steel ropes are specified and on most installations where fiber core ropes are standard.

Your Roebling Distributor has full details on Herringbone, or contact Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

*Reg. App. For

ROEBLING

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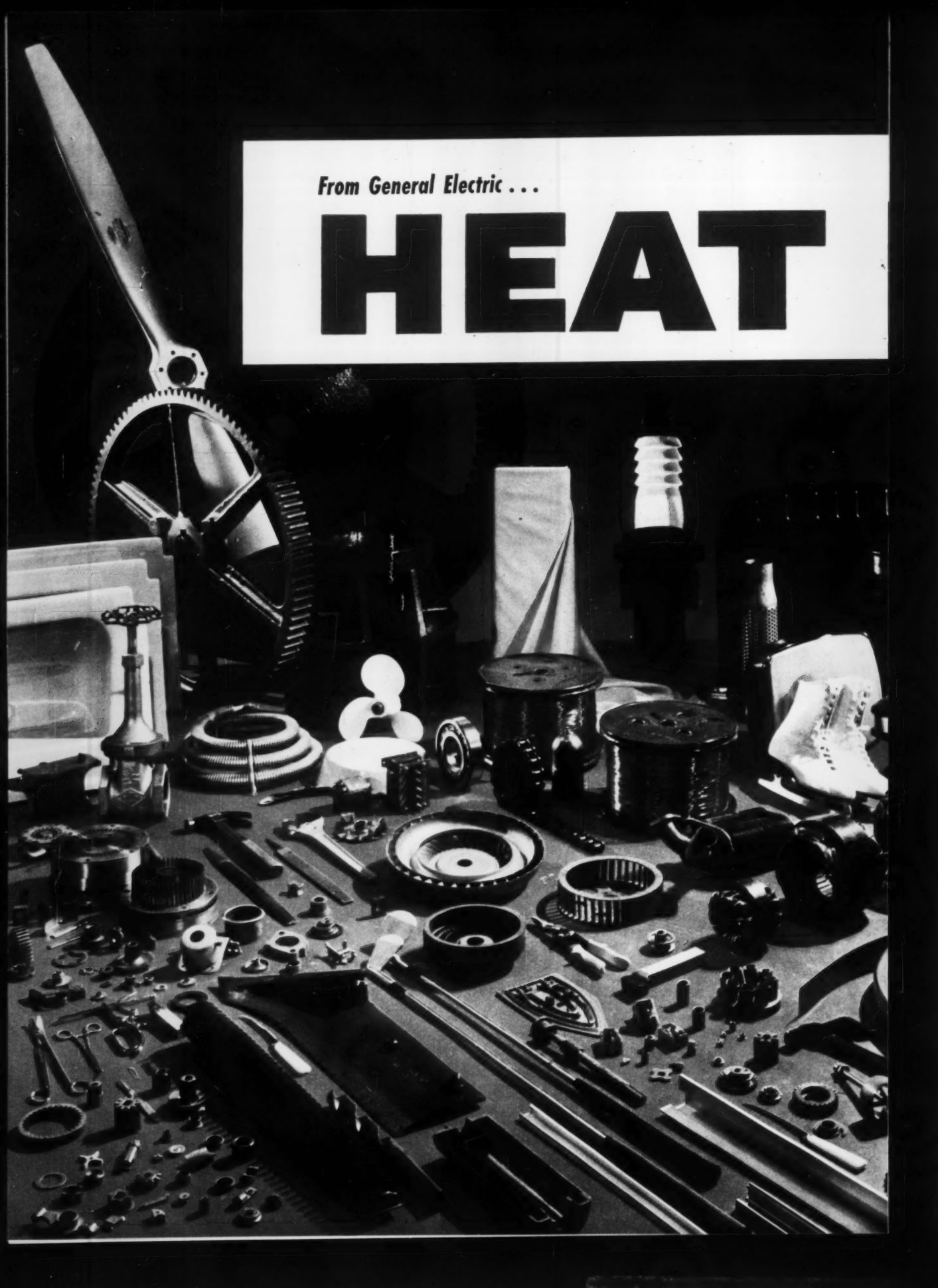

From General Electric . . .
HEAT

CUSTOMER SAVES $45,000 IN ONE YEAR

New General Electric furnace development offers similar savings for other bright stainless steel brazing and heat treatment operations.

General Electric design and engineering skill have produced another significant improvement in the construction of heat processing equipment. Engineering development on the application of high purity refractories eliminated the need for metal muffles for this bright stainless annealing and brazing operation which requires high temperature, low dew point heat treatment.

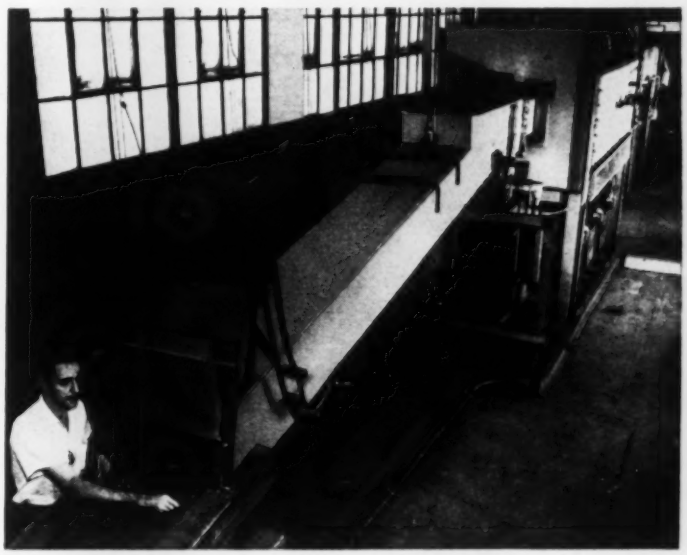
As a result, maintenance and downtime expense for replacing the muffles was eliminated; atmosphere leakage was greatly reduced, and consequently, the customer saved enough to pay the initial cost of the equipment in one year!

This new development, with its significant savings, is equally applicable for other brazing and heat treatment equipment requiring high temperatures and a low dew point. For instance, this design can be adapted to roller hearth, bell, pusher and other furnace types.

Call your G-E Heating Specialist now. He will be pleased to figure your potential savings with new heat processing equipment. The items in the picture at left may offer you ideas on products you process which would be adaptable to General Electric gas-fired or electric furnaces. Contact your nearest General Electric Apparatus Sales Office or write Section 721-22, General Electric Company, Schenectady 5, New York.

The items shown at left are typical of the many products which have benefited from General Electric heat treatment developments—and cost savings often result. For example . . .

Substantial savings resulted when high-purity brick was used in this mesh-belt furnace eliminating the need for costly furnace muffles which require frequent replacement. This is a major technological advance for the furnace industry with today's trend toward higher temperature operation and the need for atmospheres with very high purity. Similar savings can be made for other difficult to treat components which require bright brazing or heat treatment.



Progress Is Our Most Important Product

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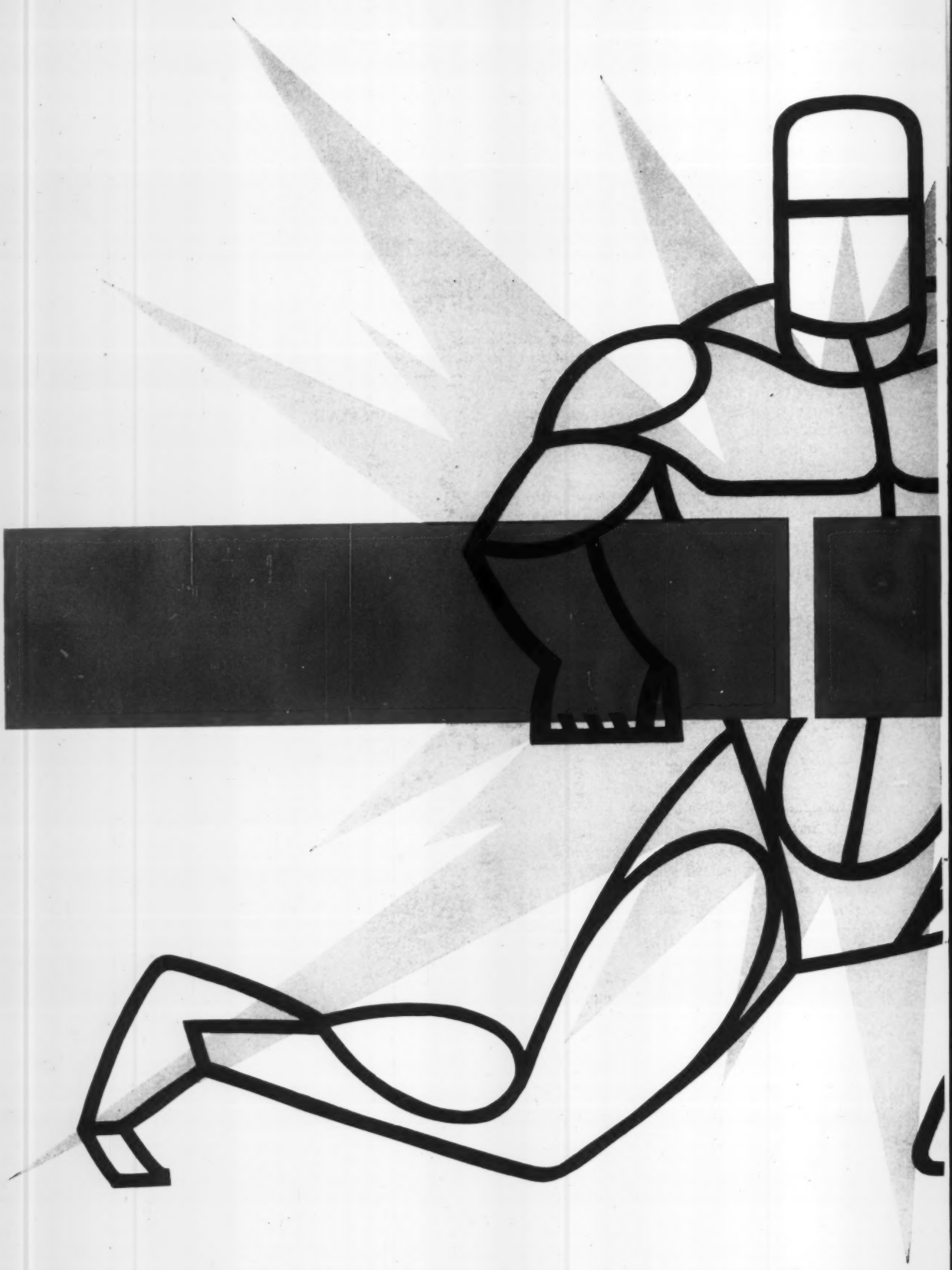
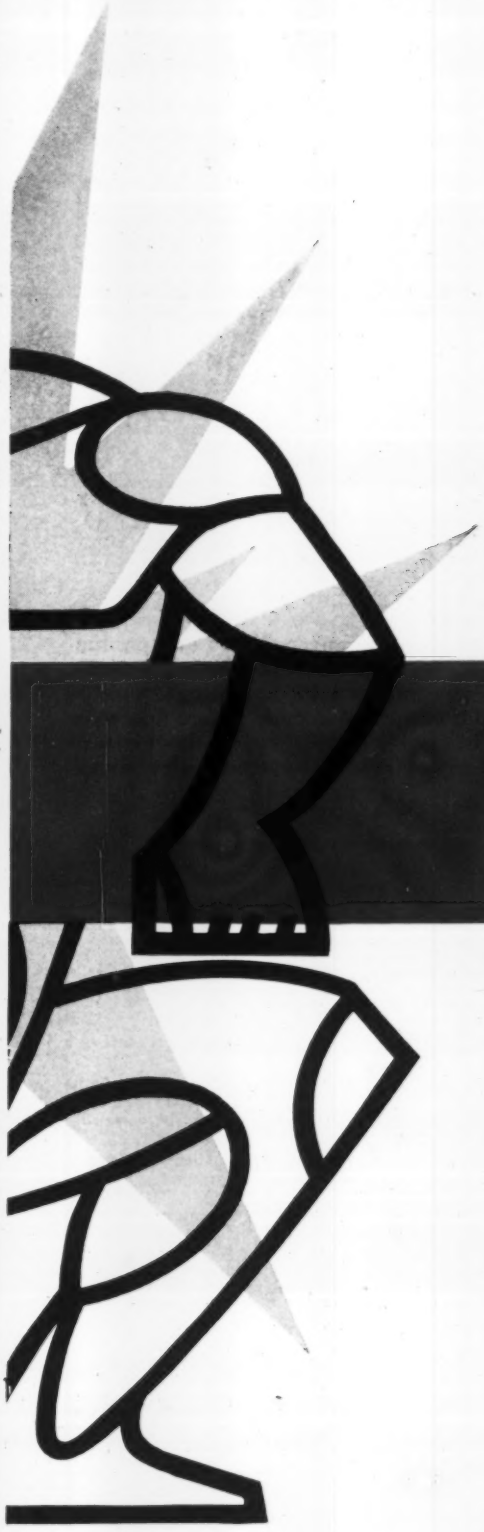




COMBINES SUPERB WELDABILITY WITH EXTRA STRENGTH

N-A-XTRA

BEST LOW-ALLOY EXTRA-STRENGTH STEEL YOU CAN BUY

When only the strongest steels will do, specify N-A-XTRA HIGH-STRENGTH. This low-alloy heat-treated steel is now available in minimum yield strengths ranging from 80,000-110,000 psi.

Along with this great strength, N-A-XTRA is readily formed and fabricated. It can be welded by any process. The most drastic welding tests on N-A-XTRA have shown no underbead cracking, even when plate temperatures are as low as —60°F.

Because N-A-XTRA is nearly three times stronger than mild carbon steels, it gives designers an opportunity to eliminate useless dead weight from finished products and realize substantial savings. Let us show you how N-A-XTRA HIGH-STRENGTH steel can do a job for you. Write Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-7.

GREAT LAKES STEEL

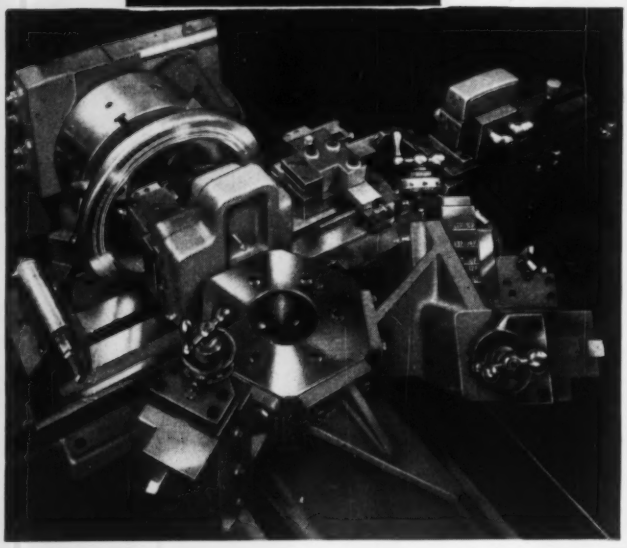
A DIVISION OF NATIONAL STEEL CORPORATION

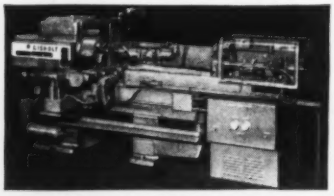
YOUR PARTNER in PRODUCTION

Your Gisholt Representative can save you time and help you make more money. Call him when you make your next estimate.

Got a new job coming up? Are you sure you're down to rock-bottom costs? Using the smartest setup? Combining all possible operations? Making the most of new accessories and machine features?

Your Gisholt Representative can tell you. He's an authority on the newest tooling methods and production techniques. He's a member of the Gisholt "Round Table"—a staff of specialists in machining problems who have helped hundreds of manufacturers find ways to lower costs. He's ready to help *you*—without cost or obligation. Call your Gisholt Representative today. Or write us.





A typical example of your Gisholt Representative's cost-cutting ideas

Above, a Gisholt MASTERLINE NO. 3 Ram Type Turret Lathe with hydraulic drive has become a rugged, low-cost automatic chucking lathe—but it still retains the versatility and quick setup of a hand-operated machine.

For example, the setup at left is handled by a female operator. Adjustable tooling permits machining 14 steel stamping sizes, $\frac{7}{8}$" to 2-15/32" width, $3\frac{3}{4}$" to $15\frac{3}{4}$" diameter, with minimum change-over. In one automatic cycle a typical part, $15\frac{1}{4}$" diameter, is completely machined (14 surfaces) in just 3.30 minutes f.t.f. With minimum investment, the new ram type lathe with hydraulic drive lowered production costs and provided automatic chucking turret lathe efficiency.

For complete information on the Hydraulic Drive, ask your Gisholt Representative or write for Form 1182.

GISHOLT

The Gisholt "Round Table" represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.

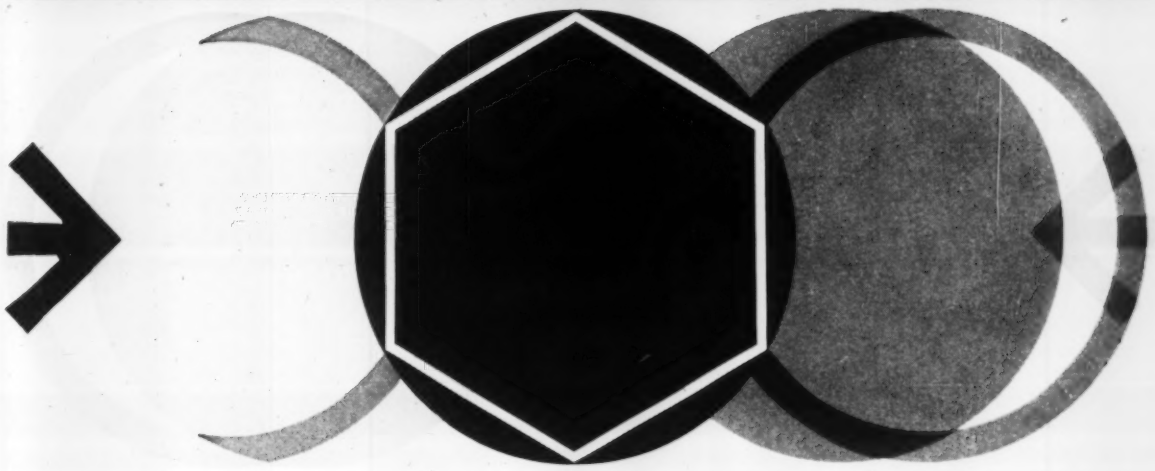
GISHOLT MACHINE COMPANY

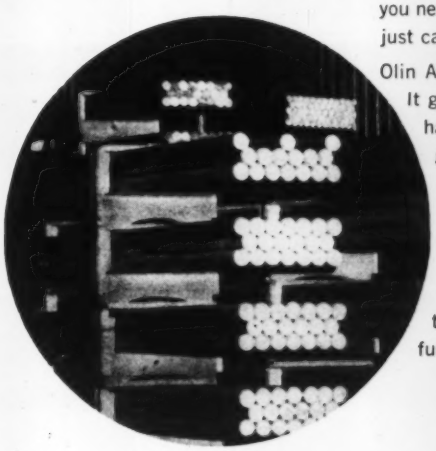
Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Machines
• *Factory-Rebuilt Machines with New-Machine Guarantee*

NOW! IMMEDIATELY AVAILABLE FROM OLIN ALUMINUM... COLD PROCESSED ROD AND SCREW MACHINE STOCK





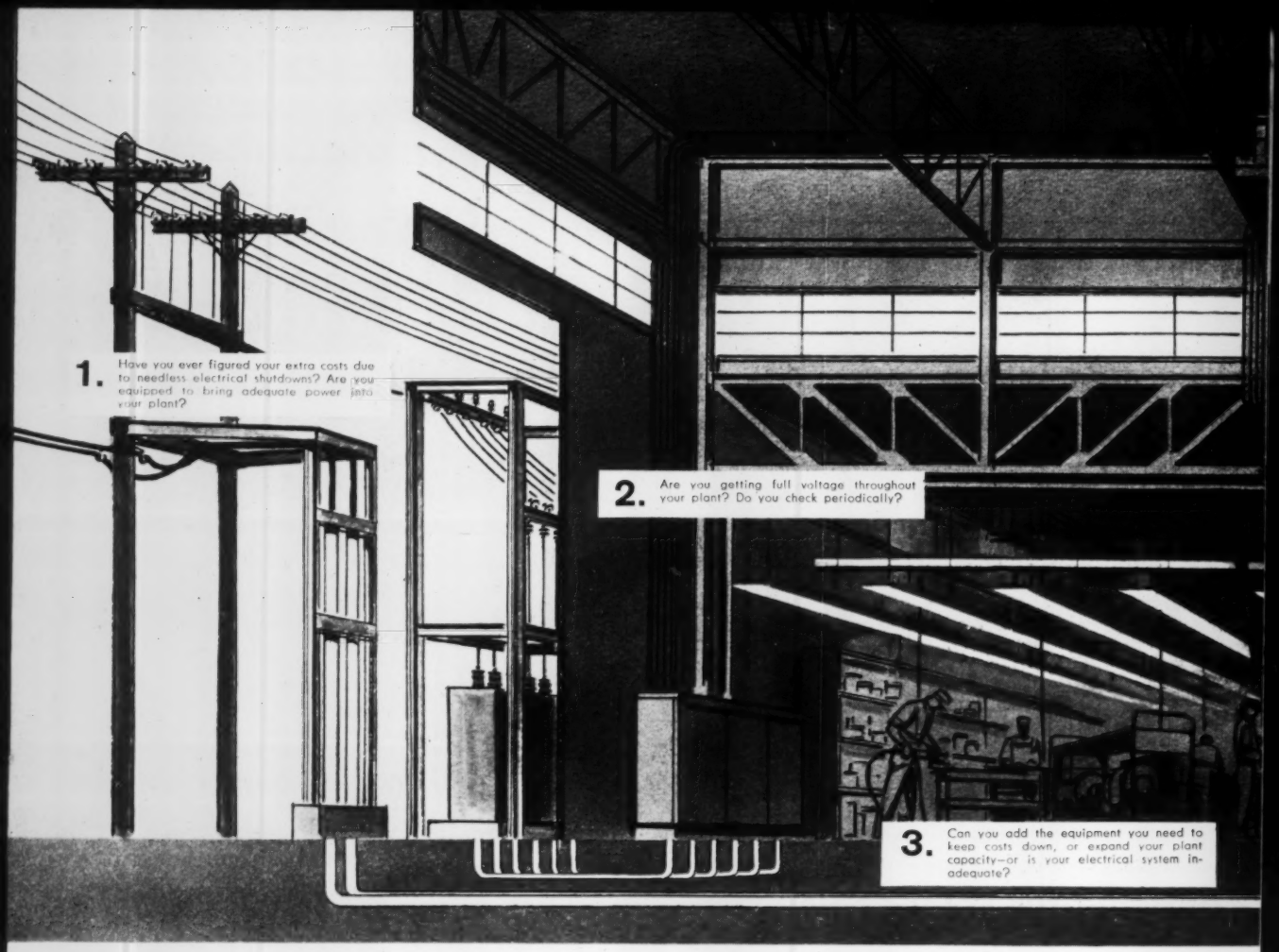
Olin STAK-PAK gives you easier handling and greater stackability . . . protects your stock against scratching and abrasion.

For all the high-quality aluminum rod and screw machine stock you need . . . when you need it and as you need it . . . just call your nearby Olin Aluminum sales office or distributor.

Olin Aluminum is today's fast-moving, machinable metal. It gives you top-speed cutting. It's rapidly handled and shipped. It's cold processed for uniform grain size (a quality plus). You get three times as many parts per pound as you get with other metals and—in many cases—aluminum parts need no further finishing. You save many ways! What's more, you can always count on fast technical assistance from the design, metallurgical and technical services of Olin Aluminum—America's new, fully-integrated producer.

OLIN ALUMINUM

OLIN MATHIESON • METALS DIVISION • 400 PARK AVENUE • NEW YORK 22, N. Y.


1. Have you ever figured your extra costs due to needless electrical shutdowns? Are you equipped to bring adequate power into your plant?
2. Are you getting full voltage throughout your plant? Do you check periodically?
3. Can you add the equipment you need to keep costs down, or expand your plant capacity—or is your electrical system inadequate?

HOW MUCH CAN A HIGH-VOLTAGE CABLE SYSTEM SAVE YOU?

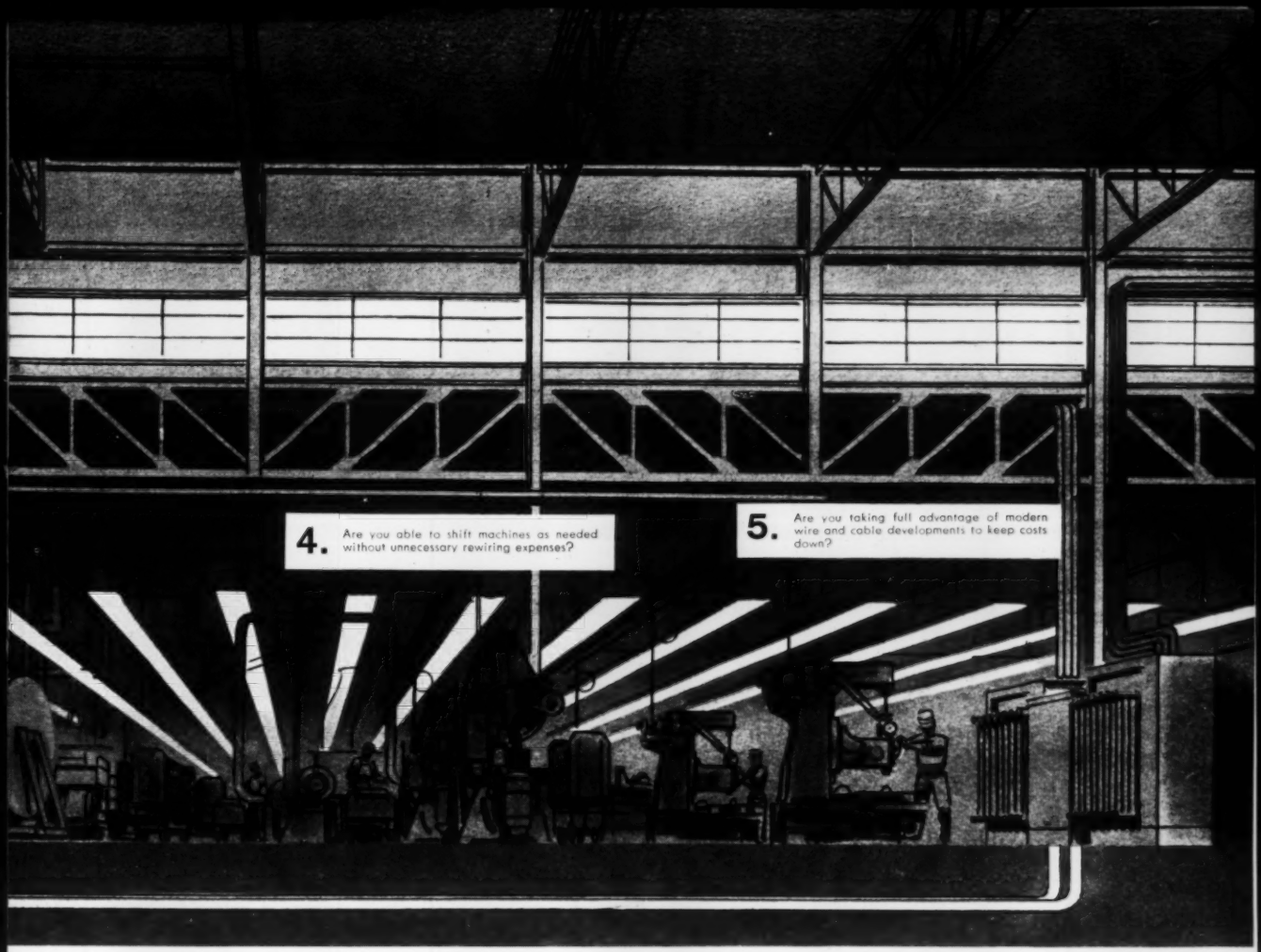
These 5 questions may lead you to some important cost reductions. And Anaconda technical specialists are available to help you get the answers.

1. Have you ever figured your extra costs due to needless electrical shutdowns?

These extra costs can be: lost production time, cost of labor standing by while repairs are made, damage to goods in process, loss of business due to delayed delivery, cost of repairs themselves. Such shutdowns can be caused by overloaded circuits, poor quality or overaged cable, or inadequate protection against nonelectrical hazards such as chemical fumes, atmospheric conditions, mechanical damage. Your electrical department, your electrical contractor or the Man from Anaconda can help you avoid these costly shutdowns by recommending proper cable for your present or future electrical system.

2. Are you getting full voltage throughout your plant? Do you check periodically?

Low-voltage conditions in your plant can bring about reduced production, excess current consumption, failures of motors from overloading. It can even prevent the use of all your machines at the same time. That's why it is important to bring power into your plant at sufficiently high voltage to service present *and* anticipated


4. Are you able to shift machines as needed without unnecessary rewiring expenses?
5. Are you taking full advantage of modern wire and cable developments to keep costs down?

requirements. Dependable cable, of course, is of the utmost importance – the cable produced by Anaconda and discussed on the following two pages.

3. Can you add the equipment you need to keep costs down, or expand your plant capacity —or is your electrical system inadequate?

Inadequate cable capacity in your plant results in *excessive* power loss caused by increased voltage drop. Not only are you paying for *wasted* power, but your electrical system is incapable of handling modern cost-saving equipment. *Efficiency* is down and so are profits.

4. Are you able to shift machines as needed without unnecessary rewiring expenses?

Plant inflexibility can strangle both growth and efficient operation. Plants wired in rigid conduit, for example, often make the shifting of machinery slow and expensive. Cables such as Anaconda butyl-insulated Duralox,* with its *built-in* interlocked armor, and flexible Anaconda Powerduct Cable eliminate such expensive rewiring when equipment must be moved – save you time, money, labor and permit cost-saving freedom in the arrangement of your machinery. You'll find further details about them on the following pages.

5. Are you taking full advantage of modern wire and cable developments to keep costs down?

Thorough inspection of your plant's electrical system, talks with your electrical engineers, qualified electrical contractors or the Man from Anaconda can show you where you are needlessly losing money. Once you discover these profit-robbing problems, Anaconda stands ready to help you do away with them – with an outstanding range of quality wires and cables for every electrical need . . . to permit you to concentrate on production with the assurance that your electrical system is the most efficient, most economical possible.

*Reg. U.S. Pat. Off.

Please turn page for more information.

ANACONDA WIRE & CABLE COMPANY
25 Broadway, New York 4, N. Y.

HOW MANAGEMENT CAN REDUCE HIDDEN ELECTRICAL COSTS WITH ANACONDA BUTYL-INSULATED, "PRECISION-BUILT" HIGH-VOLTAGE CABLE.

Management in the past has left electrical problems to electrical people—but has not always provided them enough money to do an adequate job. Result: poor performance... high costs!

A little goes a long way—especially when it's the *little extra* invested in your electrical system which will save you costs of cable failures, machine shutdowns, high maintenance, lost production.

The previous page has indicated why management should take an active interest in electrical systems . . . it has *shown how* and *where* inadequate wiring eats into your profits. Now, without being technical, let's look at *what* can be done about it . . . how new Anaconda products can make a significant contribution to your profit picture.

THE WORLD OF MODERN WIRING has made outstanding advances—and within the last few years. Here are some of the more important ones. Read them over *in light of changes that have probably taken place in your plant since the original wiring was installed.*

NEW HIGHER VOLTAGES. Many electrical problems in plants today can be traced to low-voltage conditions. That's why higher plant voltages—with resulting increased efficiency—deserve primary consideration. A few years ago, high voltages posed a problem: ozone, a by-product of high-voltage operation, destroyed ordinary insulation, causing premature cable failure. Anaconda engineers have solved this problem with pioneering work in new *butyl-rubber* insulations. (See below.) There is a high-voltage Anaconda cable to fit every plant need: corrosion-resistant Durasheath,* Duralox Interlocked Cable that needs no conduit, and easily installed weather-resistant Anaconda Aerial Cable.

*Reg. U.S. Pat. Off.

TESTS... SERVICE RECORDS—THEY ALL PROVE

Anaconda Butyl (AB) Rubber Insulated High-Voltage Cable gives you more amps per dollar

Anaconda Butyl (AB) insulation gives performance far beyond industry specification standards — in *every* important electrical and physical property. Butyl rubber has inherent high resistance to ozone, heat and moisture. Thus, compounding efforts ordinarily spent to obtain these qualities have been devoted to the development of other desirable properties . . . giving you a cable with *quality throughout.*

To provide added assurance of peak performance, Anaconda manufactures its butyl-insulated high-voltage cable under controlled conditions on the most modern equipment, subjects it to rigorous tests. These tests have proved conclusively Anaconda Butyl (AB) has greater resistance to ozone than any other known rubber insulation. The real proof, however, is the service records of the millions of feet of Anaconda butyl-insulated high-voltage cables giving years of dependable superior service to utilities and industrials.

This advertisement can, of course, provide only a few examples of how modern Anaconda wires and cables are helping industry achieve more efficient production . . . reach full power for full profit. Your own electrical department, your qualified electrical contractor, consulting engineer or the Man from Anaconda can give you personal and expert assistance with the wiring needs of your plant.

59238

ANACONDA® WIRE &

25 BROADWAY,

NEW CABLE HAZARDS. Chemicals, moisture, oils — natural to most modern plants — are tough on cable. Engineers at Anaconda have come up with an answer: Durasheath, made with Anaconda Butyl (AB) insulation and specially compounded neoprene jacket — a superior product for low and high voltages. This rugged cable resists almost every enemy of cable life. And it is versatile. You can use it throughout your plant — aerially, in ducts, buried directly in the ground. It reduces down-time, maintenance and replacement costs. In addition to Durasheath, Anaconda offers the following cables with the same outstanding resistance qualities: Duralox Interlocked Cable, Aerial Cable, Densheath 900 industrial wire, all-purpose 20-10 thermoplastic control cable.

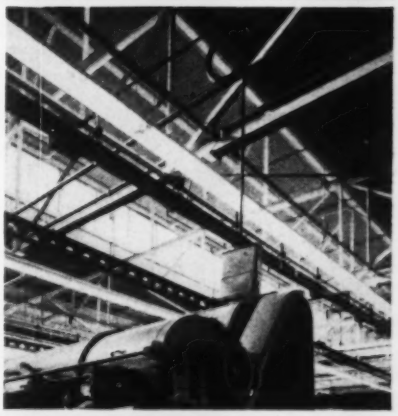
NEW OPERATING CONDITIONS. These have put new demands upon wiring. Higher loads generate more heat in cable . . . and more heat in cable, whether installed underground or in other moist locations, can destroy cable insulation. Today, Anaconda Butyl (AB) rubber insulation, used on many Anaconda rubber power cables, does the job withstanding *heat* and *moisture* at higher operating temperatures.

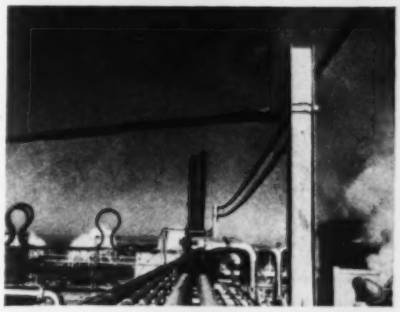
NEW EQUIPMENT. The introduction into plants of process-heating equipment, process or comfort air conditioning, and new production machines calls for new wiring to carry the increased load. Anaconda Interlocked-Armor Cable can be installed up to 40% quicker than many other types of cable because it needs no conduit. You save time and money when the cable is installed — and later, too, if cable must be moved. This cable is 100% salvageable, it reduces fire hazard . . . can be taken down and used again when plant changes are required.

MODERN BUSWAY SYSTEMS. Anaconda's flexible Powerduct Cable now makes it possible to increase the flexibility of your busways as never before. It just plugs into the busduct . . . and unplugs when you want to move machines. No costly conduit to put up or rip out. You effect important savings in production time and in labor. In addition, Anaconda Powerduct Cable is also 100% salvageable on every move!

NEW POWER. As modern plants find the need of bringing more and more power into their working areas, more and more are choosing Anaconda Aerial Cable. It's a wise, economical choice — especially where the underground area is congested with pipes and other structures, or contains corrosive agents. Anaconda Aerial Cable is easy to install — even between closely spaced buildings where clearance is limited. Anaconda Aerial Cable is neat, safe, reliable, lower in cost than underground systems.

NEW ELECTRICAL EQUIPMENT. The trend to automation and more complex machines puts new emphasis on control cable. Here, again, Anaconda's years of cable experience has paid off in a full and constantly growing line of superior control cables — with modern types of insulations and coverings to give them highest reliability. The most promising control cable development is the all-purpose 20-10 thermoplastic design for 600 volt service (30-15 control cable for 1000 volt service). Anaconda Control Cables — both in rubber and plastic — assure you the most reliable service.



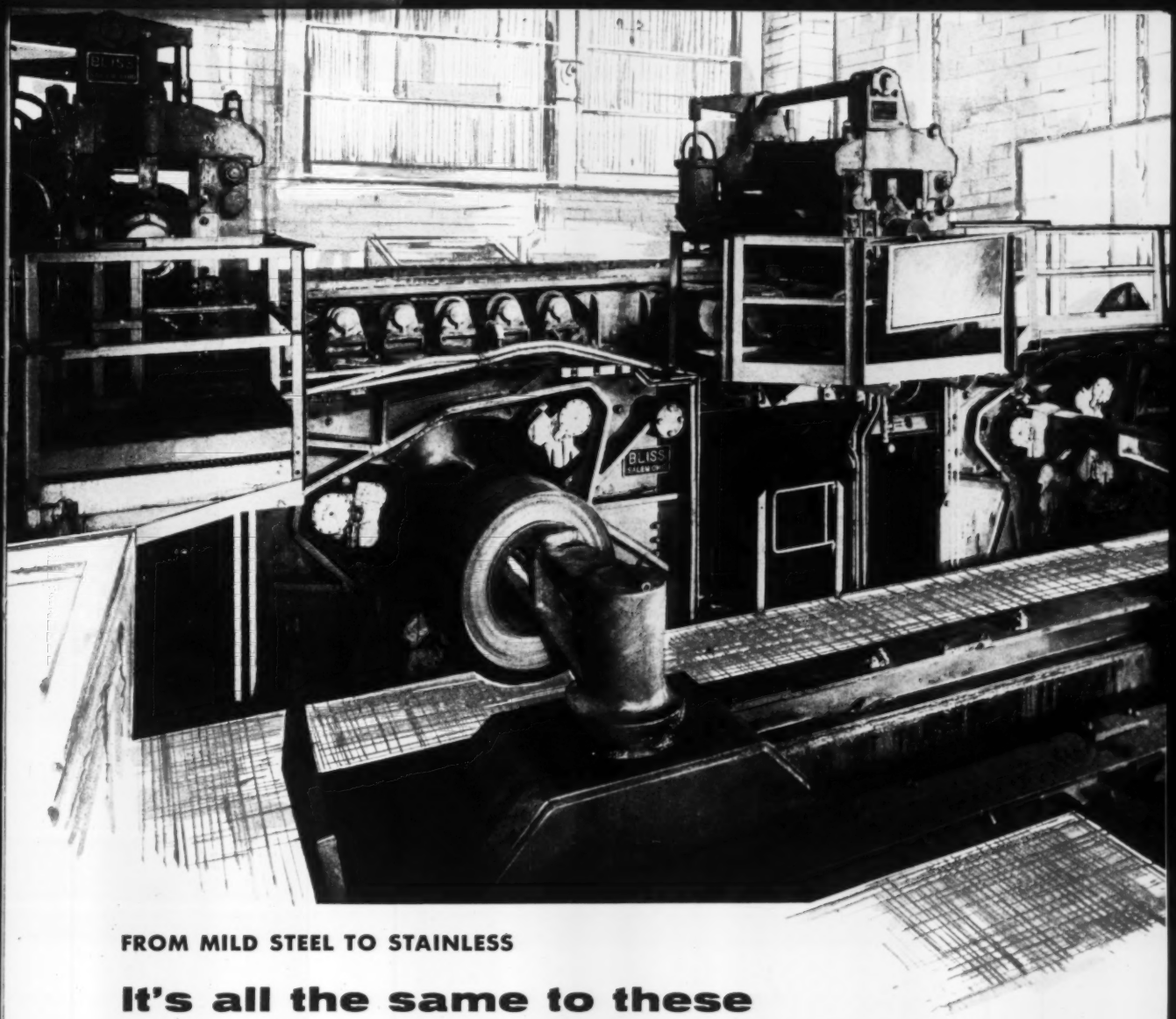


CABLE COMPANY

New York 4, New York

You get steel + plus from U. S. Steel

"I sold them a steel that cost more, so they could pay less,"
SAYS TOM HALLORAN, USS SALES REPRESENTATIVE, PITTSBURGH
"One of my customers, Elliott Company, made some of their turbine discs from a special alloy steel that had to be forged, cross-rolled, heat-treated and torch-cut to size *before* machining.
ROLL IT...
...AND PAT IT...
...AND MARK IT WITH "E"...
SEEMS TO ME THERE'S AN AWFUL LOT OF ACTIVITY AROUND HERE
"I visited the plant with a USS metallurgist who joined a team of Elliott engineers to study their operation, They found they could use USS "T-1" Steel, which is furnished to meet 100,000 PSI minimum yield strength in plate thicknesses up to 2½" inclusive. This eliminated *all* the pre-machining operations.
...AND PUT IT IN THE OVEN FOR ELLIOTT AND ME
USS and "T-1" are registered trademarks
"Elliott adopted "T-1" and, even though it cost a little more than the previous steel, it cut material costs 60%, because it saved work.
WHAT'S THIS... LUNCH HOUR, COFFEE BREAK OR A SIESTA?
NOPE... M' REGULAR SHIFT... WE GOT A NEW SYSTEM AROUND HERE
"Technical assistance in the selection and most economical uses of steel is only *one* of the U.S. Steel plus services."
When you buy from U. S. Steel you get steel plus technical assistance . . . research . . . facilities . . . marketing assistance
USS
United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel



FROM MILD STEEL TO STAINLESS

It's all the same to these two Bliss coilers at Armco

These smooth-running Bliss downcoilers on the new 56" hot strip mill at Armco Steel Corporation's Butler, Pa. Works, coil everything from flexible mild steel to tough, springy stainless steel strip. Bliss coilers, with their expanding mandrels and positive wrapping action were used because of the variety of gages and alloys to be put through the new mill. In the Bliss design, the mandrel keeps the strip in tension during coiling; wraps a tight, smooth-edged coil without surface scratches or marks. Blocker rolls retract as soon as leading end has been snubbed on the mandrel, and don't move in again until the trailing end is coming through the pinch rolls.

Besides the two downcoilers, Bliss' Rolling Mill Division designed and built the 100-yard-long runout table as another contribution to the Butler Works' handsome new hot strip line. For other examples of Bliss engineering for the ferrous and nonferrous industries, why not write for a free copy of the new profusely illustrated 84-page Bliss Rolling Mill Brochure, Bulletin 40-B? It describes the operation of Bliss mills and auxiliary equipment.

BLISS
SINCE 1857

Bliss is more than a name . . . it's a guarantee

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

THE 49TH STATE IS BORN...

Commemorated in Enduring Bronze

Alaska, born January 3, 1959, is the first state to be admitted to the United States since Arizona became the 48th state on February 14, 1912.

Commemorating this rare and unusual occasion is the Alaska Statehood Official bronze medal authorized by the first session of the First Legislature of the State of Alaska and reproduced from models by Medallic Art Company of New York City.

Issued July 4th, this memorable medal may be obtained from leading department stores and coin dealers.

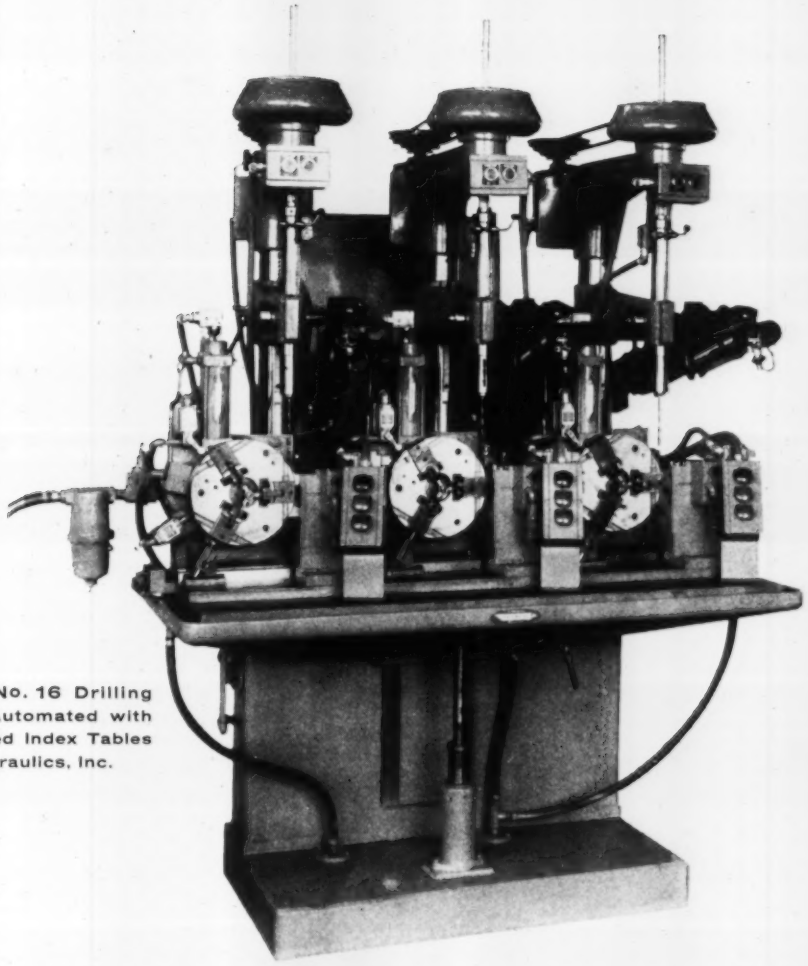
Special bronze alloys, carefully formulated to exacting specifications are continually prepared in our mills in Bristol for commemorating this and other historic events.

Eisenhower inaugural medals struck by Medallic Art Company . . . special bronze alloy supplied by Bristol Brass.

The **BRISTOL BRASS CORPORATION**

Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT.



"Buffalo" No. 16 Drilling Machine Automated with Air-Operated Index Tables by Air Hydraulics, Inc.

8 YEARS OF SATISFACTION MADE THIS SALE!

Nothing sells a product like customer satisfaction. Here's proof:

Eight years ago a large mid-western manufacturer bought a "Buffalo" No. 16 Drilling Machine. It proved to be an excellent production machine. Quantity and quality of output were high. The No. 16 stood up to the punishment of continuous production with a minimum of maintenance.

This year the manufacturer decided to automate certain drilling and reaming operations. Because of eight years of complete satisfaction, a new 3 spindle "Buffalo" No. 16 Drilling Machine was specified.

The mechanism for automating the "Buffalo" Drill was designed and built by Air-Hydraulics, Inc. of Jackson, Michigan. Air-Hydraulics used its Model "H", 10" dia. Air-Operated Index Tables. The automated operation was drilling and reaming three lug-holes on the work piece.

The production rate was originally estimated at 150 pieces per hour. Air-Hydraulics reports that the actual production rate is 215 pieces per hour.

Here's a case of "three-way" satisfaction, with "Buffalo" Drills. Both the manufacturer and Air-Hydraulics are satisfied. And we are happy that our customer's satisfaction dictated the choice of a new "Buffalo" No. 16 Drilling Machine for this automation job.

For this kind of complete satisfaction, why don't *you* specify "Buffalo" Drills? Contact your "Buffalo" machine tool dealer, or write us direct for full information.

BUFFALO FORGE COMPANY

158 Mortimer Street Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

To produce finest quality appliances

Richard Powell, general manager, and Stanley R. Burns, works manager, of Whirlpool's Clyde, Ohio, plant in the customer test booth where Whirlpool automatic washers are quality proved prior to delivery.

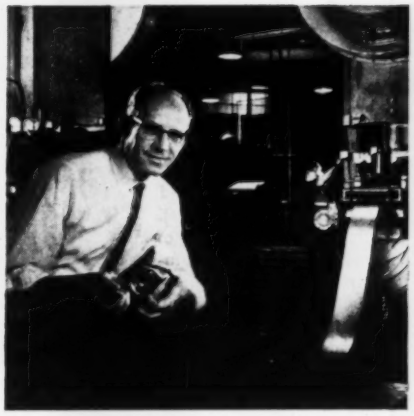
—Whirlpool begins with....

Quality Steels

The name Whirlpool has always symbolized quality in the appliance market. To assure continuance of this desired position the Whirlpool Corporation is careful to demand the finest quality materials from their suppliers.

Recently, Whirlpool's Clyde, Ohio, plant named the Sharon Steel Corporation as "Supplier of the Month" for two months in succession. We here at Sharon are proud of this commendation for it stands as tangible evidence that our desire to work with and provide our customers with the finest steels and service the industry has to offer has gained recognition in an industry where service and quality are important.

Sharon service is complete service and Sharon Steels are the finest made.
Sharon Steel Corporation, Sharon, Pa.



"To keep Whirlpool first line requires first line steels—Sharon does this consistently" —Lester First, Director of Quality Control of Whirlpool's Clyde, Ohio, plant.

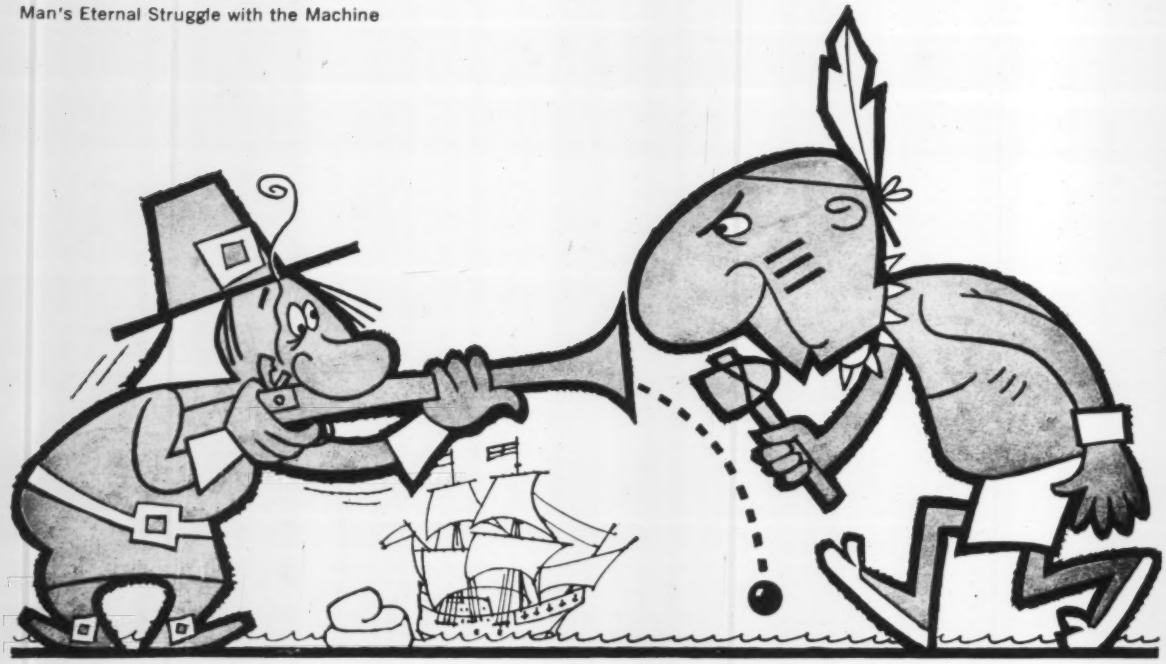
"When you design for quality, the steel is important—for this reason Sharon has become a trusted supplier"—Albert Coleman, Director of Engineering.

Richard S. Rice, Director of Purchasing, presents Sharon salesman Myron Kauffman with his second in succession "Supplier of the Month" award as steel buyer Raymond Celek looks on.

SHARON *Quality* **STEEL**

SHARONSTEEL

Man's Eternal Struggle with the Machine



RISING COSTS AND SHRINKING PROFITS EXERT UNUSUAL PRESSURES ON PROCUREMENT

What is the risk of letting conditions tempt you to select the lowest bid?

You're in a tough spot to say the least!

Because if you care at all about *your* future or your company's profits, you take every precaution to make sure that "real deal" price tag is hanging on a machine that *will* do your job.

Obviously, price alone is indicative of nothing more than the bidder's determination of cost, plus the profit any manufacturer must earn to remain in business—nothing more—no true suggestion of value . . . and, of course, never even a hint of equipment suitability to *your* needs.

Unfortunately, the lowest bid often results from price cutting under competitive pressures. And price cutting *necessarily* down grades equipment value—unless the price-cutter is in business for reasons other than making a profit!

Sciaky resistance welding and production equipment *must* satisfy *your* manufacturing requirements. And Sciaky manufacturing operations must earn a profit just as your company must. That's why Sciaky *first* determines what *will* satisfy your requirements, and then figures the cost of putting it to work for you.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

Recently a procurement official boasted of his subterfuge to reduce costs . . . "tell every vendor his bid is way out of line, and you can brow-beat them into substantial price reductions." Besides the question of ethics, he's cheating his company of its ability to manufacture profitably, as well. Because no vendor can deliver more than he gets paid for—that is, not if he intends to stay in business. When that official's manufacturing operations begin to sag under the dead weight of phony equipment bargains, who do you suppose is going to be holding the proverbial bag?

SCIAKY

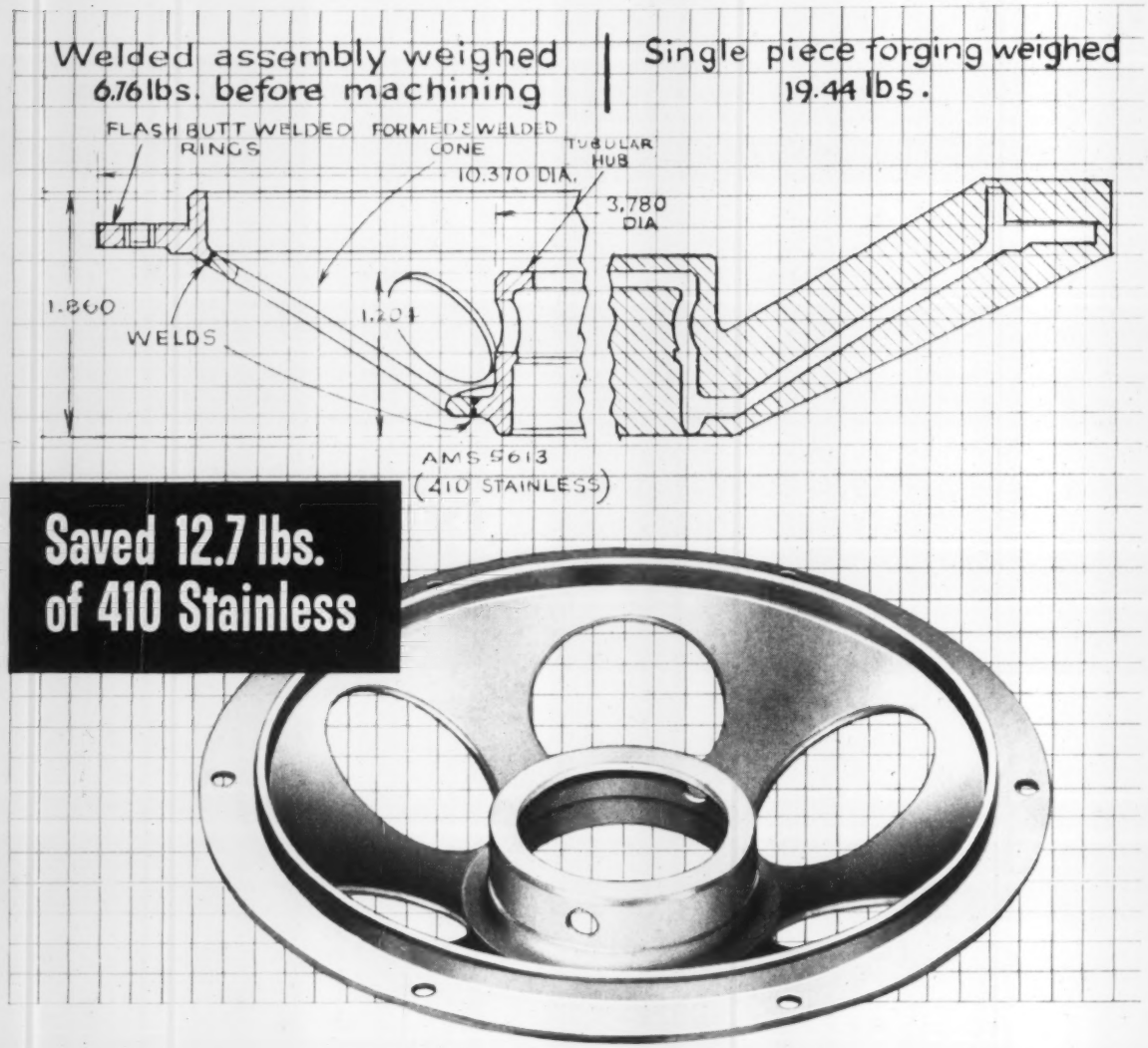
SCIAKY BROS., INC., 4909 W. 67th STREET, CHICAGO 38, ILLINOIS • POrtsmouth 7-5600

Call Crucible for stainless of uniform excellence

The lustre of Crucible stainless is achieved through precision-rolling on modern mills. Uniform physical properties are maintained by checking each heat — while electronic measuring controls ensure accurate gauge. Such methods produce coil after coil of uniform excellence. For stainless in all gauges down to .010" and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.



Saved 12.7 lbs. of 410 Stainless

Cost of Jet Engine Component Reduced $31.21 by Flash Butt-Welded Ring Assembly

Visualizing this jet engine assembly as three simple parts, instead of a single complicated piece, was the first step in reducing its cost.

By circumferential welding, a flash butt-welded ring, a formed and welded cone, and a tubular hub were joined together. Material required was reduced 65% and hours of machining were eliminated on each piece.

This fabricating know-how has helped many companies cut the cost of circular parts and components, particularly where high-strength, high-temperature alloys are involved.

On prototype and production runs, Amweld's subcontracting service includes the assistance of experienced engineers and metallurgists. Send us prints and specifications . . . we will be happy to study your problem and perhaps suggest ways that fabrication by welding can help you reduce costs.

GET THE FACTS ABOUT AMERICAN WELDING

Complete information. Facilities brochure, Precision Assemblies Catalog, and booklet on "How Flash Butt-Welded Rings are Made."

THE AMERICAN WELDING & MFG. CO. • 110 DIETZ ROAD • WARREN, OHIO

AMERICAN WELDING

August 24, 1959

Steel Users in Better Shape than Steelworkers

More than half the nation's metalworking companies have enough steel to support normal operations into early October, a recount by STEEL shows (Page 45). But USW members are feeling the pinch of the strike. The AFL-CIO plans to call a massive rally of key officers of its member unions to raise funds for the striking steelworkers. It's an effort to keep lack of income from causing enough pressure to force Dave McDonald's hand.

Warning: Another Step in Union Monopoly Trend

The International Association of Machinists and the United Auto Workers together represent about 600,000 workers in the aircraft, missile, and electronics industries. So you can't disregard their joint conference in Kansas City, Mo. It represents an important step in consolidation of labor and concentration of power. Many employers regard it as an ominous move. It promises to buttress pattern bargaining at a time when employer resistance to such a position is at a peak. If the IAM and UAW are successful in their upcoming bargaining with the aircraft people, it will encourage other unions to follow the same procedure. Result: Giant labor coalitions with the power to tie up huge resources. It's another reason for mounting pressure to make unions subject to the antitrust laws.

Why McDonald Still Rides High

USW members seem willing to back their president, Dave McDonald, to the bitter end in his fight for a better contract. But observers think the strong backing is strike incited and that the fervor will die down after a settlement. Some think that Mr. McDonald stands to lose popularity when the workers compare their strike losses with what they'll gain, if anything. Don't look for him to make any major internal moves until after the next election. He'll concentrate on improving his popularity (Page 47).

GNP Is 5% Above Prerecession Peak

Gross National Product hit an annual rate of $484.5 billion in the second quarter—up $14.5 billion from the first period, reports the Commerce Department. It represents a 3 per cent gain in real output, says Commerce, because price hikes in the second quarter were "limited." It means GNP has

zoomed up 12.5 per cent since the recession low and that it's now 5 per cent above the prerecession peak.

Sequel: The Case of the Vanishing Markets

U. S. imports from Europe during the first half were 42 per cent greater than they were in the like 1958 period. U. S. exports to Europe dropped 9 per cent. It means U. S. manufacturers lost $866,694,000 worth of sales to their European competitors.

Yes, Cast Steel Parts with 300,000 psi Tensile

Such strength—two to three times higher than normally thought possible—has been realized in experiments. The men responsible: Metallurgists at American Brake Shoe Co.'s Research Center. The findings promise to give castings a berth on the team of materials that will take on critical jobs in top aircraft and missile projects. Example: Missile ring in picture. The process incorporates only one proprietary secret: The ceramic for the cope and drag molds (Page 84).

How Metalworking's Profits Stack Up

While many segments of metalworking came booming out of the recession to set earning records in the first half, some of the biggest gains came in non-metalworking industries. Here's a comparison developed by the First National City Bank of New York:

Industry groups	% change 1st half '59 vs. '58	Industry groups	% change 1st half '59 vs. '58
Automobiles & parts	+198	Machinery	+ 42
Iron & steel	+120	Paper & allied products	+ 39
Tires & rubber products	+ 98	Electrical equipment	+ 24
Cement, glass, stone	+ 77	Petroleum production & refining	+ 24
Chemical products	+ 74	Other transportation equipment	− 13
Other metal products	+ 53	Total manufacturing	+ 56

Where Car Leasing Is Going

Expect about 420,000 cars to be leased this year. Most will be V-8s. Chevrolet will continue to be most popular. On the average, leased cars will be kept longer. For what leasing offers, see Page 52.

Consumer Credit to Double

By 1980, consumer loans will probably exceed $90 billion—vs. around $45 billion now. That's the belief of the University of Michigan's Thomas G. Gies. He cites four reasons: 1. Households in the U. S. will increase by one-third to around 70 million. 2. The number of young families—biggest credit buyers of consumer durables—will become proportionately larger. 3

The suburban population (homeowners who spend a large share of their income on durable goods) will bound up twice as fast as total population. 4. Family incomes will rise enough to make more persons credit worthy.

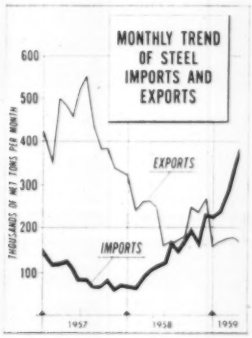
Why Metalworkers Boost Equipment Spending

From a Treasury Department study comes proof that the more money a company invests, the wider its profit margins will be. In 1957, companies with assets of less than $1 million had average net profits equal to only 1.9 per cent of sales. Firms with assets over $1 million earned an average of 9 per cent on sales. That's why companies are buying more equipment. Example: Orders for heat treating equipment will rise 53 per cent (Page 54).

Material Handling Equipment Orders Climb Sharply

Producers of material handling equipment recorded their sixth consecutive monthly order increase in June. June bookings hit the highest level since June, 1956, and the second highest level on record. First half dollar volume of orders climbed 33 per cent above the total for like 1958 period.

The Intersection Marks the Danger Spot



These crossing lines represent a major threat to the nation. They show how the U. S. has lost its favorable trade position in steel products. The direction and curvature of the lines signal the severity of the situation. Imports are headed toward the level representing the highest export tonnage U. S. producers ever enjoyed, while U. S. exports are slipping badly. Foreign steel is being shipped into the U. S. at more than triple the year-ago rate. Exports during 1959's first half were 222,382 tons below the level of 1958's first half.

Lead Price Increase Coming?

An upsurge in lead sales was in full swing last week. Responsible: An upturn in demand from battery makers plus last minute scare buying by customers fearing a strike at lead mines and refineries. A higher price seems unjustified on the basis of consumption, but you could see a hike if mines and smelters are shut down.

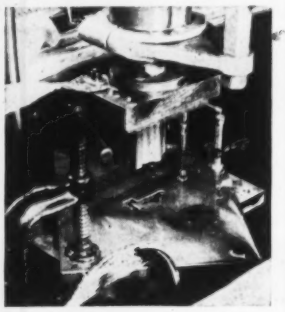
You Can Bid at Auction via TV

On Sept. 23, Industrial Plants Corp., New York, will auction around $3.5 million worth of used forging equipment from General Electric Co.'s Lynn,

Mass., River Works, over closed circuit TV to bidders in Boston and Chicago. Videotape will be used to demonstrate the machine tools in operation. On Oct. 7, the U. S. Surplus Disposal Administration will auction used machine tools and office supplies over a six city, closed circuit system.

Electromachining Moves into Production Work

Expect electrospark and electrolytic machining methods to become more common in production jobs. Started as toolroom innovations, they're beginning to take over less specialized work. Examples: Spark machining is moving into diesinking. Electrolytic machining is proving itself on the newer, difficult-to-work steel alloys. Other coming applications: Making precise odd shaped holes, working with hard alloys, burr problems, tough alloys (Page 80).



New Laws Could Lower Shipping Costs

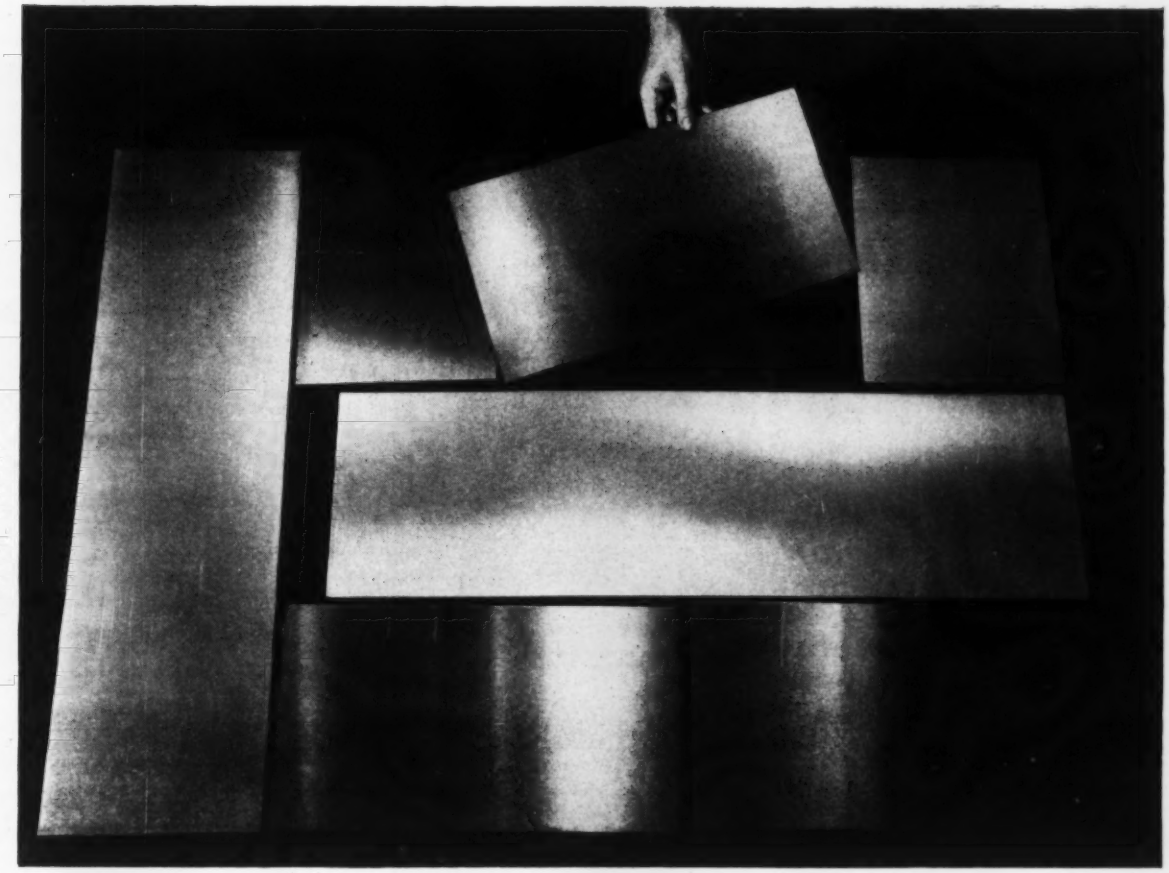
New laws voted by legislators in 12 states will permit bigger payloads per truck, reports Commerce Clearing House, Chicago. The rules concern overall truck lengths. Examples: California, Oregon, and Washington will now permit 65 ft trucktrailers; the previous maximum was 60 ft. Nebraska and North Dakota upped their limits from 50 ft to 60 ft. Connecticut, Massachusetts, New Hampshire, Georgia, and Tennessee have hiked their maximums to 50 ft.

West Coast: A Haven for Electronics

The electronics industry is nearly a $2 billion annual business in the 11 western states. This year's sales by 770 firms in the 11 states are estimated at $1,932,000,000 by John A. Chartz, president, Western Electronics Manufacturers Association. The industry employs 146,000 in the area vs. 11,000 a decade ago. The biggest concentration is in California's Los Angeles and Orange Counties, where 461 firms, employing 84,000, sell $1.2 billion worth of products annually. The 11 state region accounts for 18 per cent of the nation's electronics firms, employs 19 per cent of the industry's work force, and markets 23 per cent (in dollar volume) of the industry's products.

Straws in the Wind

A Purchasing Agents Association of Chicago survey shows that 63 per cent of the firms in the area will introduce new or more automation during the next six months . . . Raytheon Co.'s Semiconductor Div. reduced transistor prices 11 to 36 per cent . . . Beryllium Corp. is delivering reactor grade beryllium metal to the AEC in greater quantity than called for in its contract; it will divert some production to the fabrication of aircraft and missile components . . . Shipbuilding backlogs dropped 30,000 tons during July.

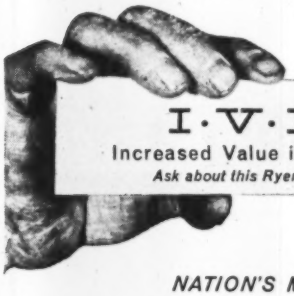


How many sheets could you make from today's waste aluminum?

If you tend to shrug off scrap as an unavoidable business loss, here's a plan that can change your thinking. It's the Ryerson Aluminum Sheet Plan that makes exact lengths and widths available to most users—generally on a *net weight basis.*

Under this plan, you order the exact sizes you need for your production runs—and Ryerson produces them quickly from coil stock on the most modern and accurate slitters and cut-to-length lines. You thus avoid buying metal that you cannot use . . . save the time and labor of processing within your own plant. And in addition, Ryerson can schedule deliveries to match your production pace, enabling you to convert storage space to more productive use and release capital tied up in inventories.

Here you'll find the widest selection of alloys, tempers and thicknesses plus expert technical help on selection and fabrication problems. So ask your Ryerson representative to review your production requirements with you and show you how to eliminate your scrap problems immediately.



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Increased Value in Buying Metals
Ask about this Ryerson Plan for 1959

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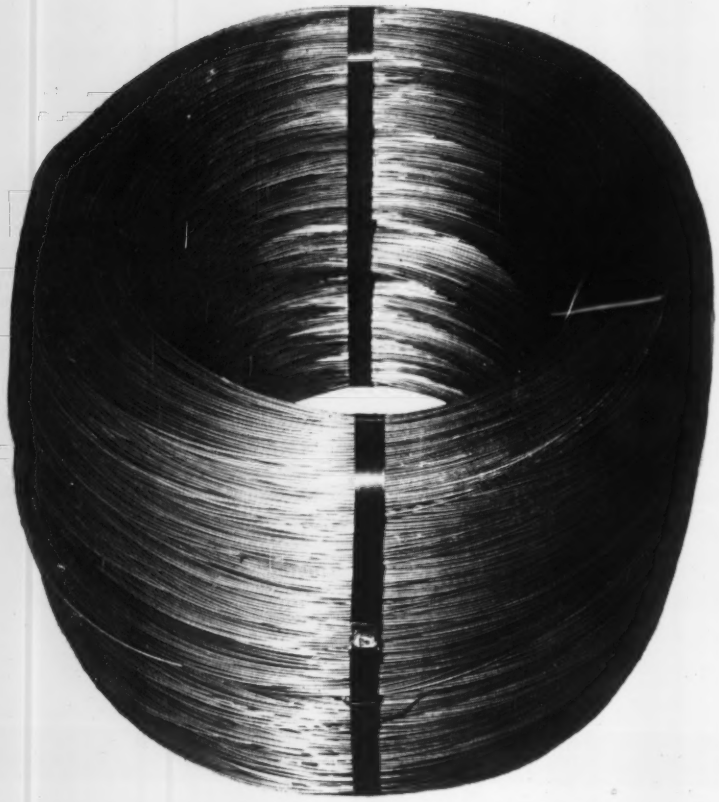
Look into DSC—Portsmouth LPR COILS

to help widen your profit margins or strengthen your competitive position



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Long Production Run LPR's cost no more than traditional short-run bundles but provide advantages that have revolutionized the Brite Wire Fabricating business. Look what they have done for us in the manufacture of DSC Welded Wire Fabric. We'll share our experiences with you.

HERE'S THE GIST

of what progressive LPR users report:

• • • downtime frequency due to coil changes and setup adjustments decreased from 50% to 92.8%

• • • cumulative coil-remnant scrap losses trimmed to the bone . . . overall manhour costs cut 15% to 20%

• • • small coil racks discarded

EXTRA LPR BENEFITS

Possessing self-support features and greater density (weight per cubic foot) LPR's reduce storage area, cut unloading time from 15% to 50%, expedite material handling generally . . . rid you of the inconvenience of caring for vendors' returnable carriers . . . improve the efficiency of your inventory management.

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Customer "REP" Offices in Principal Cities

Customer Satisfaction–Our No. 1 Job

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The Coming Battle in Autos

With the introduction of its 1960 models, the automobile industry will engage in the greatest battle in its history.

It is a battle that will be fought so fiercely it could make many an outside supplier a casualty.

So far this year, the auto industry has produced 4.1 million passenger cars, or almost as many as it did in all of 1958. In 1960, it expects to produce 6.4 million units, which would compare with 7.9 million in 1955, the record year. It could be the industry's second best year.

In 1960 you'll also see the emphasis shifting from larger, more powerful cars to smaller jobs that cost less to buy and maintain. Perhaps 800,000 will be the compact cars (Corvair, Falcon, Valiant) introduced by the Big Three and the popular offerings (Rambler, Lark) of the Little Two. Stripped down versions of larger cars will also be on the market.

In 1961, the Big Three will have a third compact job. It's being developed by Buick.

Look for many changes in specifications for parts and materials. A wide area of the metalworking industry will be involved. At last count, General Motors had 26,000 suppliers, Ford 20,000, and Chrysler 13,500.

As one auto builder puts it, the buyer won't pay for things he cannot see or benefit from. This category includes dual mufflers and tail pipes, triple stage transmissions, and air springs.

The unit body is supplanting body and frame construction. Aluminum is competing with gray iron for engine blocks and transmission housings. Corvair's rear engine may mark the beginning of a trend. Many other changes affecting suppliers will take place when the 1961 models come off the drawing boards.

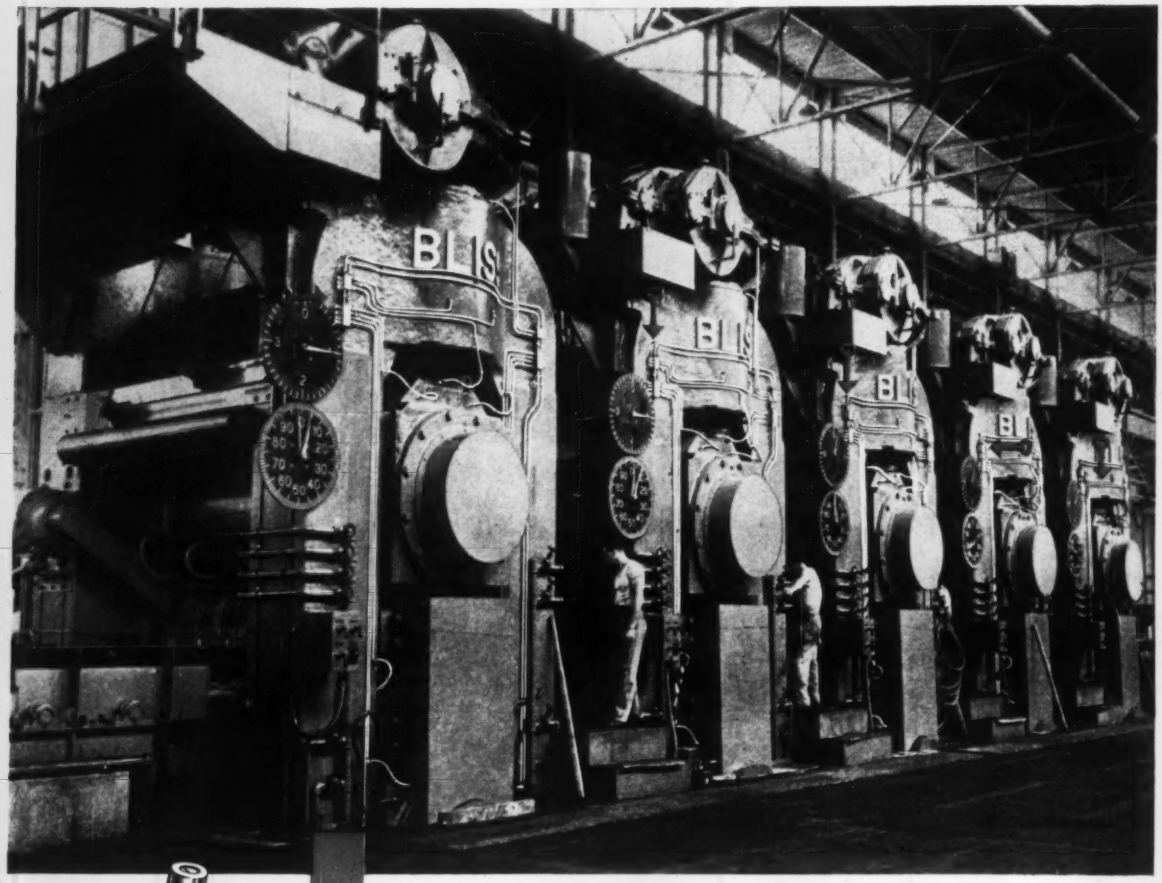
There is no pat approach for getting or keeping automotive business. But we can cite two examples of what can be done: One company has completely retooled its plant so its costs are competitive with the lowest. It intends to stay in the automotive parts business.

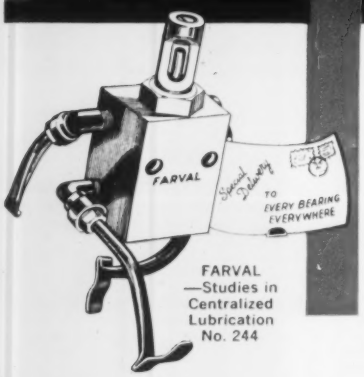
Another company is rapidly diversifying into other product lines. It will stay in the automotive parts business as long as it can.

The coming battle in autos is one you will need to watch.

Irwin H. Such

EDITOR-IN-CHIEF





FARVAL
—Studies in
Centralized
Lubrication
No. 244

Farval protects all vital bearings on Bliss Non-Ferrous Hot Mill

When an up-to-the-minute rolling facility like this Bliss 80-inch, 4-high tandem hot mill is exposed to shut down due to bearing failure, weekly production dives, costs skyrocket.

So to eliminate possible failures of the mill's vital bearings, Bliss engineers installed an automatic Farval heavy-duty, time-clock controlled centralized lubrication system. It delivers proper amounts of lubricant – when required – while the mill rolls aluminum strip at 850 feet per minute.

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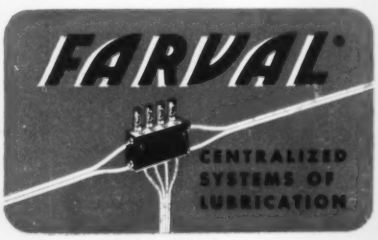


How Do Steel Stocks Stand Now?

% of Respondents Reporting

Under 20 days	20-50 days	50-80 days	Over 80 days
18%	29%	39%	14%

MORE THAN HALF of metalworking's purchasing agents say they have enough steel to last until early October, or longer.

But the STEEL recount also reveals that 47 per cent of the buyers may have problems before that time; 18 per cent have supplies for less than three weeks. The American Steel Warehouse Association, which reported that service center inventories last week stood at 3.3 million tons, says distributors should have enough supplies to operate without serious shortages until the middle of September.

• **Higher Stocks**—The STEEL reappraisal shows stocks were in better shape six weeks ago than generally supposed. It also reaffirms the inventory tonnage analysis of last week (Aug. 17, p. 129) which showed stocks high enough to sustain near-normal production schedules in most metalworking plants until October.

Inventory situations vary widely among steel users—from Maytag Co., Newton, Iowa, which has enough to last well into the fourth quarter, to A. O. Smith Corp., which began laying off employees ten days ago at Milwaukee because of plate shortages. Rivet manufacturers can last another 60 to 90 days, but many users of galvanized steel are already in trouble.

• **Fourth Quarter Outlook**—Buyers expect a good fourth quarter if the strike is over by October. More than 62 per cent say they hope to maintain 30 to 60 days' supplies of steel, on the average, for the last three months. Only 6 per cent plan levels under 30 days. Some 32 per cent of the respondents would stock for more than 60 days.

About half the steel buyers say they plan to build as high (or higher) levels of inventories in the fourth quarter as they had in June —both on a tonnage and a days-of-operation basis. However, the half who will not build up as much steel as in June are the larger users, so total tonnage would be down.

• **Restocking Problems** — Respondents predict it will take an average of 53 days to rebuild stocks to the desired levels, assuming the strike ends by Oct. 1. That means the inventory goals would not be met until late November.

After the strike, 79 per cent of the purchasing agents foresee delivery problems. Sheets will lead the problem parade. Others: Plates, structurals, bars. At least a ten-day delay is expected after the strike before shipments become even moderate.

• **Where the Pinch Hurts**—While relatively few steel users are feeling the strike's effects, more and more workers are—in steel and allied industries. Besides production people in basic steel, an estimated 100,000 in the related fields are idled by the walkout. Example: In the Cleveland area, the number of claims for unemployment compensation rose last week for the sixth successive week. They increased by 1274 to hit 12,471. The total was an 11-week high while the amount of the week-to-week rise was the largest since last winter.

The USW claims only an occasional hardship case has turned up among its striking members, but action planned by its Local 1211 at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., plant sounds like the situation is more serious. The local is one of the largest, boasting 12,000 members, and it's headed by Nick Mamula, one of the original dues protesters in the Rarick rebellion (see the story beginning on Page 47). The local plans to use its large $650,000 treasury for relief to members. What's more, it wants to start a strike fund once this walkout is over. Unlike the United Auto Workers, the USW provides no strike benefits.

• **Impasse in Negotiations**—As of late last week, the bargaining groups for the steel companies and labor were as far apart as ever. Some observers hope that the release of Labor Secretary James Mitchell's fact-finding results may move the bargainers off dead center (see Page 50), but most are even

Strike Losses

(through Aug. 24)

Lost Steelworker Wages

.....$416,400,000

Lost Sales

.....$1,218,000,000

Lost Production (ingot tons)

.....11,607,100

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

.....$232,000,000

Tax Losses to U. S.

.....$270,000,000

pessimistic about that.

The government continues its behind-the-scenes negotiating to find a settlement. If that's unsuccessful, look for President Eisenhower to invoke the 80-day cooling-off provision in Taft-Hartley by Oct. 1.

Discount the speculation that he may act even sooner to end the ore boat portion of the strike. The President might like to do so, to avoid any chance of an ore shortage next winter, but legal and union problems are too tough to make a separate case of the carriers. Only 37 of the 242 ships in the American Great Lakes ore fleet are operating.

Who's Still Operating?

All but one of the steel producers whose labor contracts expired after STEEL went to press last week avoided a strike (Aug. 17, p. 44). Firms still operating have nearly 15 per cent of the industry's annual ingot capacity. Only the Vulcan Works of the Vulcan-Kidd Steel Div., H. K. Porter Company Inc., Aliquippa, Pa., went on strike (Aug. 15) when its contract expired. The contract at the Kidd Works of the same plant will not end until Aug. 31.

Latrobe Steel Co., Latrobe, Pa., was granted an extension. Colonial Steel Co., a division of Vanadium-Alloys Steel Co., Monaca, Pa., and Joslyn Mfg. & Supply Co., Ft. Wayne, Ind., worked out agreements under which they are still operating.

Continental Steel Corp., Kokomo, Ind., reached a new contract which provides conditional acceptance of an agency shop by the company. This is a major issue in Indiana, where a right-to-work law prevents compulsory union membership. Under an agency clause, workers can be asked to pay the union a fee to compensate for representation, even though they are not members. Continental will adopt the clause only if major steel companies in Indiana accept it. The union agreed to drop the demand if such a clause is not included in big steel contracts.

Wages and fringe benefits were not an issue at Continental. Both sides had agreed earlier to follow the wage pattern set by larger companies. The present contract will be in effect until 30 days after expiration of any new contract between the United Steelworkers and major basic steel producers.

The contract at Timken Roller Bearing Co., Canton, Ohio, is the only one expiring this week.

Omitted from last week's roster of steelmakers still operating was Eastern Stainless Steel Corp., Baltimore. (Annual ingot capacity: 80,000 tons). Its present contract extends 15 days past a big steel settlement.

Alcoa Talks Resume; Kaiser Plant Idled

Aluminum Co. of America and three unions representing 26,000 employees at 25 Alcoa plants resumed negotiations last Wednesday. (Unions: United Steelworkers, United Auto Workers, Aluminum Workers International.) The talks were the first since pacts with an original expiration date of July 31 were extended four weeks ago. Other aluminum producers agreed to the same extensions.

The agreement provides for contracts to be in effect until 30 days after a settlement is reached in the steel industry. It also states that contracts can be terminated by the union of companies on ten days' notice if no agreement is reached by Nov. 1 or 30 days after the steel settlement.

• **Kaiser Plant Closed**—The foil laminating and printing plant of Kaiser Aluminum & Chemical Corp., Belpre, Ohio, closed last Tuesday. About 100 employees were affected. Reason: The plant's metal supply was cut off by a wildcat walkout at the firm's aluminum smelter (annual capacity: 145,000 tons) and fabricating plant, Ravenswood, W. Va. The company had no official word on the issues involved in the walkout which idled 2000 AFL-CIO workers.

McDonald Rides High in USW but,...

Can his popularity last when the strike is over? He's uneasy to find himself and his union in one of the toughest struggles in America's labor relations history. That's why the USW is currently the most important of the four big groups studied by STEEL in its series on metalworking unions

"OUR CAUSE is righteous," the speaker declared. "God is on our side, and we're going for the bundle."

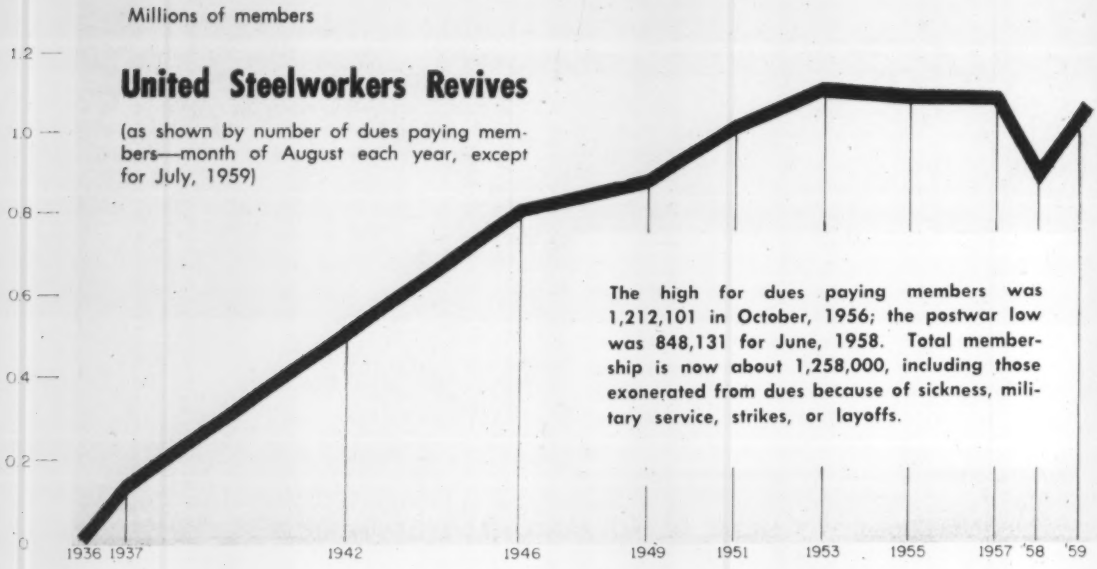
Thunderous applause shook the rafters of Pittsburgh's Memorial Hall. Walls reverberated as 2000 United Steelworkers cheered, whistled, and stomped. There wasn't much doubt about it: Union members would back their president to the bitter end in his fight for a better contract. David J. McDonald was miles away at the bargaining table in New York, but he got the message.

For a man whose empire seemed to be tottering only a few months back, Mr. McDonald shows surprising strength. His "billion dollar bundle" theme hit exactly the wrong note (annoying the public and winning no union support), but when all seemed lost, industry leaders unwittingly helped him find a responsive chord.

• **Strategy Backfires** — Instead of concentrating on the dangers of inflation and competition from foreign mills, company negotiators broadened their attack and asked the USW to consider contract changes which would "generate new economic progress." Their aim was to show flexibility—to let Mr. McDonald know that he could have a face-saving increase if he would agree to the elimination of wasteful and inefficient work practices.

But the move backfired. Mr. McDonald proclaimed an emergency, charging that steelmakers were out to bust the union and reduce its members to slavery. Fear psychology worked wonderfully where economic appeals had failed. Resistance hardened as the strikers rallied around their leader. At once he became a hero.

• **Key Question**—But will he still be so popular after the strike is over and his members will have the opportunity to compare their losses with their gains, if any? They'll have to win a big pay boost and work many hours to make up for wages going down the drain at the rate of $72.8 million a week. Another thing: When peace returns to steel, their leader's union-busting charges may also appear less well founded than they do now. Members may be bitter and blame


Millions of members
United Steelworkers Revives
(as shown by number of dues paying members—month of August each year, except for July, 1959)
1.2
1.0
0.8
0.6
0.4
0.2
0
1936 1937
1942
1946
1949
1951
1953
1955
1957 '58 '59
The high for dues paying members was 1,212,101 in October, 1956; the postwar low was 848,131 for June, 1958. Total membership is now about 1,258,000, including those exonerated from dues because of sickness, military service, strikes, or layoffs.

him for pulling them out.

Mr. McDonald, head of the USW since Mar. 11, 1953 (when he succeeded Philip Murray), has never enjoyed his predecessor's popularity with the rank and file. When his executive board raised monthly dues from $3 to $5 at the 1956 convention, all hell broke loose. Donald Rarick, an unknown grievance committeeman from McKeesport, Pa., challenged him for the presidency. In the February, 1957, election the vote was 404,172 for Mr. McDonald and 223,516 for Mr. Rarick.

Although Mr. Rarick and other leaders of the dues protest group were defeated, they continued their opposition from behind the scenes for more than a year. At the union's ninth constitutional convention (Atlantic City, N. J., Sept. 15-19, 1958), Mr. McDonald charged his tormentors with "dual unionism," an offense punishable by expulsion. The rebels are still in the union (trials at the local level exonerated them), but they're keeping quiet for the duration of the strike.

• **Dues Protest Dead** — Although Mr. Rarick insists that his movement isn't dead, he declines to say whether he'll run again. "It's too early," is his explanation. Other rebels admit defeat but feel their efforts weren't in vain. Says one: "It will be a long time before anyone tries to raise dues the way it was done in 1956."

Most observers have reached two conclusions: 1. The dues rebellion brought Mr. McDonald down to earth. He's making a conspicuous effort to identify himself with the rank and file. Witness his trips to the picket lines. 2. He isn't likely to give his rivals another campaign issue before the next election.

• **He'll Run Again**—Mr. McDonald's term doesn't expire until May 31, 1961, but he has already informed his friends that he'll run again. Since there's no limit to the number of terms he may serve and no compulsory retirement age (he'll be 57 on Nov. 22), there's no telling when he'll depart. If the next term is his last, look for I. W. Abel, the vastly popular secretary-treasurer, to succeed him. Mr. Abel is 51. Others to watch: District directors Joseph P. Molony of Buffalo, William J. Hart of Tarentum, Pa., Kay Kluz of Ambridge, Pa.

• **Sizing Him Up**—When Mr. McDonald took over the union, industry leaders were hopeful that he might exhibit "labor statesmanship." For a while, it was even rumored that steelmakers were disposed to "do something for Dave" at contract time. If that feeling ever prevailed, it died a sudden death. "Disenchantment set in long before the 1956 negotiations," a steel executive declares. "McDonald hasn't shown any statesmanlike attributes."

Minimizing the USW chief's role, another steelman comments: "Arthur Goldberg (see box on Page 49) does most of the talking. McDonald just sits there and wonders when they're going to lift him up on their shoulders and carry him around the room."

• **Big Wage Gains**—If he were campaigning for re-election today, Mr. McDonald could cite an impressive record. In the six and a half years since he took office, steelworkers' hourly rates have jumped from $2.03 to $3.10. Average hourly earnings in all manufacturing crept from $1.67 to $2.19 during the same period.

Active (dues paying) membership has fluctuated from a high of 1,212,101 in October, 1956, to a postwar low of 848,131 in June, 1958 (see chart, above). About half the USW's membership is in basic steel, the rest in iron ore mining and transportation, aluminum (32,500), can companies, and fabricating.

• **No Fiscal Worries**—Raising dues may have caused Mr. McDonald grief, but it didn't hurt the union's treasury. Net worth increased from $21.4 million on June 30, 1956, to $32.8 million on Dec. 31, 1958. (Net worth of the United Auto Workers is estimated at $30 million.)

Resources aren't under great pressure during a strike because the union doesn't pay strike benefits

(as does the UAW) except in cases of need.

• **Union Invades Offices**—Of all the problems USW leaders must face in the years ahead, none looms larger than the inexorable loss of production and maintenance jobs. The union, fearful that automation will decimate its ranks, is stepping up its drive to recruit office and technical workers. Since 1941, when the first whitecollar contract was signed in basic steel, the USW has nailed down agreements with more than 120 companies. The 1956 convention set up a special whitecollar task force. "We've put in about 30 locals since then," says Vice President Howard R. Hague, "but the recession stymied our efforts."

Whitecollar membership is estimated at 45,000. About 45,000 others are covered by production and maintenance contracts in plants where the office and technical people are in such a minority that it wouldn't be practical to establish separate bargaining units. This is often the case in the can companies. "Interest is just starting to build up," Mr. Hague continues. "These people have been so close to management for years that it's hard to sell them."

• **Aids Foreign Unions**—On the international level, the USW exchanges contract information and data on working conditions with foreign unions through the International Federation of Metalworkers. Last year, the USW contributed $20,000 to a union in India that was fighting Communist infiltration.

In the early 1950s it helped bauxite miners in Jamaica to organize a union by sending them money and technical assistance. It has often fostered union movements in South America and Mexico.

• **Policies Unchanged** — "We've carried out Phil Murray's policies almost to the letter," Mr. Hague declares. "There have been few changes since 1936. We feel that people in the same business should pay the same wages and provide the same working conditions. But in dealing with fabricators, we take into account their ability to pay. We've been realistic in our approach to the smaller companies. Our objective is to keep them in business."

Fabricators interviewed by STEEL took violent exception to Mr. Hague's statement. Said one: "I'd be tickled to death to debate that with him. One of his men warned me recently: 'Look, if you can't maintain the wages we think these people ought to have, you can go out of business.'" A titanium processor said the union hadn't the slightest interest in his protestations that he couldn't pay steel wages because he'd been forced to cut his selling prices.

Concurring with Mr. Hague, a steel company official declares: "I don't see any change in union policies. They continue to follow the old line of more, more, and more—irrespective of problems in the industry or the country. There's one possible exception: Perhaps they're less interested in the further erosion of management's rights than they were during the Lee Pressman era. Now they're concentrating on the economic issues."

Goldberg Heads USW 'Brain Trust'

Arthur J. Goldberg, 51, is considered by many to be the brains of the United Steelworkers of America. He has been the union's general counsel since 1948. On the USW's top team bargaining with the steel industry, he has been the most articulate of the four members.

In addition to his job with the steelworkers, he is counsel for the AFL-CIO's Industrial Union Department. Before the merger of the AFL and CIO, in which he was instrumental, he was the CIO's counsel.

Mr. Goldberg is the author of several books on the union movement.

Will peace in steel be speeded by making public the facts gathered by Labor Secretary Mitchell (right)? Labor observers checked by STEEL don't see how the action can help much directly because all the data revealed have already been well publicized by one side or the other. Indirectly, the U. S. move may help arouse public sentiment and thus, perhaps, lead to a quicker settlement.

Mitchell Prepares Reference Book

LABOR SECRETARY James Mitchell stepped more squarely into the steel negotiations last week by making public (with permission of the President) about 40 pages of facts bearing on the dispute.

The steel companies and the union had a preview of the material with Bureau of Labor Statistics people. Neither side was too happy with the original document and asked for certain additions. The secretary complied with the wishes of both parties and appears to have come forth with a good reference book on steel statistics.

• **No Analysis**—The secretary describes the study as "background," not an analysis of the situation. He concludes: "The presentation may serve to indicate the area which exists for a settlement in which the public's interest is taken fully into account."

The facts themselves appear to represent almost every possible view on the many questions being discussed in the New York negotiations, with heavy emphasis on wages, prices, productivity, and profits.

• **Why Made Public**—Publication of the work (it was done by the BLS statisticians) is perhaps a direct result of the clamor on Capitol Hill for the White House or Congress itself to do something. The latest development was a demand by Sen. Jacob Javits (R., N. Y.) that Mr. Mitchell reveal his facts. Whether it prompted the secretary to action is a moot point. At the least, it is probably better from the administration's view to get the facts made public via Republican rather than Democratic action.

Sen. Stuart Symington (D., Mo.) has been asking that Congress "go on record" in favor of a settlement.

• **Controversial Productivity** — The report is certain to stir some comments from the steel companies on its coverage of productivity. The producers have argued long that simple output per manhour is not synonymous with productivity, yet the secretary's report devotes a full page to the device, which is endorsed by the union as a good guide to productivity. For the 12 months ended June 30, the BLS figures indicate a jump from about 152 to 175 (1940 is the base year of 100), for output per wage employee manhour. Output per all-employee manhour rose from about 136 to 158.

But employment costs per unit of steel output have dropped from 270 to 253 in the same period. Wage employee cost per unit of output doesn't show quite so large a drop: From 241 to 232.

• **Other Facts**—The impact of imported steel products on the domestic industry will also come up for more discussion following the publication of the secretary's report. "Imports of steel products started increasing in 1955 and in May, 1959, were at a rate of $550 million per year. In the second quarter of 1959, imports of steel products exceeded exports for the first time in postwar history," the fact book says.

Other facts covered by the secretary include familiar statistics on industry capacity, markets, employment, wages, fringes, price changes, and the relation of profits to sales and stockholders' equity.

Average profits of 20 steel companies (as a percentage of net worth) are shown to be below the average of the 25 largest (net worth) industrial firms in the country for 1955-57. U. S. Steel Corp., Republic Steel Corp., and Bethlehem Steel Corp. rank below the average profits of the 25 leading firms used in the comparison but above the average of the 20 steel firms.

Steel prices, notes the report, are 178 per cent above 1940's prices. Steelworkers gross $3.10 an hour compared with the average manufacturing worker's $2.23 an hour. (Gross earnings include incentive earnings, premiums for overtime, shift differentials, and changes in skill levels.)

If Phil Murray Were Alive . . .

THE STEEL STRIKE should end on the basis of "labor-management collaboration for greater gross productivity in which both may share," as stated by the late Philip Murray when he was president of the United Steelworkers of America.

So says Harold J. Ruttenberg, past president of Stardrill-Keystone Co., Pittsburgh, and former research director of the USW, in a letter to USW President David J. McDonald.

• **How to Boost Wages**—With such a collective bargaining contract, Mr. Ruttenberg predicts that steelworkers' "earnings will multiply during the next decade and their living standards will double by 1975."

He adds: "The USW has gotten about all the wages, hours, and working condition benefits that are in the cow by just milking her. You can only get more benefits through union - management co-operation that helps to feed the cow."

• **Labor Guideposts**—Mr. Ruttenberg reminds the USW president of Philip Murray's book, *Organized Labor and Production*, written 20 years ago, in which he divides "the developing attitude of industry toward its personnel" into four phases: 1. Paternalistic and non-unionized. 2. Union recognition, collective bargaining, and a written contract. 3. Gradual strengthening in contractual relations and continued efforts toward improvement in "hours, wages, and working conditions." 4. Beginning of labor-management collaboration for greater gross productivity.

Mr. Ruttenberg thinks Phase 1 lasted in steel from the industry's start until President Roosevelt came to power in 1933. Phase 2 lasted from 1933 until U. S. Steel Corp. recognized the union and signed its first written collective bargaining contract in March, 1937. Phase 3 extended until the 1956 contract expired in July. Phase 4 should begin in 1959 with the next contract.

Mr. Ruttenberg also recalls that Philip Murray wrote this in his book: "Power, wherever it lies, cannot in the long run be disassociated from responsibility. If the labor movement fails to develop an adequate sense of responsibility for output, the alternative will be increasing tension and bitterness over wages, hours, and working conditions, reducing the opportunity for constructive accommodation between management and labor."

Copper Unions Picketing

OPERATIONS at U. S. copper facilities came to a virtual halt last week as thousands of workers belonging to the International Union of Mine, Mill & Smelter Workers joined picket lines at plants and mines from coast to coast. A big portion of lead and zinc output is also affected.

• **Not a Short One**—It looks like a long, bitter strike is in the offing. Weeks of fruitless negotiations point up the wide chasm between labor and management. As STEEL went to press, only two offers had been made to the union. Both were rejected. The possibility existed that some facilities would be allowed to operate temporarily, but refusal of the union to back down on what the companies term "inflated and unrealistic" demands made any truce unlikely. Some observers believe the copper shutdown may last longer than the steel dispute.

• **Settlements May Vary**—One factor stands out: If Mine-Mill expects to make an industry-wide settlement by using one company's offer to pry concessions from others, it's going to be disappointed. Costs vary from producer to producer. What one company might be willing and able to pay bears no relationship to another producer's situation, say industry people.

For example, the Anaconda Co. refused to accept a "keep working" proposal by Mine-Mill that would have committed the company to eventually settle on the same terms as other firms in the industry.

• **To Fight "Make Work"**—Look for copper management to fight more strongly than ever for elimination of featherbedding practices. They are especially severe at the mine level.

• **USW Is Patternless** — Further confusing the outlook is the attitude of the United Steelworkers of America which so far hasn't followed any pattern in its settlements. For example, union negotiators turned down a Kennecott offer of around 18 cents an hour plus other concessions. Yet it settled last week with Calumet & Hecla Inc.'s copper mining division for 10 cents an hour in wages over two years, plus some small fringe benefit gains. It also settled with Lewin-Mathes Co., a division of Cerro de Pasco Corp., for a smaller package than the Kennecott offer.

How to Cut Business Auto Expense

CONTROLLING business car expense is a constant management battle. Many firms lose it because they're unfamiliar with the fine points of running a fleet. That's a prime reason why more companies are switching to fleet leasing. Its growth has doubled since 1956.

Surveys by Ford Div., Ford Motor Co., indicate about 415,000 cars will be leased this year. Next year, the figure is expected to jump to 455,000. That includes rentals. Salesmen, servicemen, and maintenance men are the biggest users. Many firms also lease a few cars for executives, often in lieu of extra pay. Less than 20 per cent of the autos are leased to individuals.

• **Who Leases What?**—Lee Fleet Management Inc., Cleveland, surveyed companies leasing 1700 cars and discovered that 1500 were Fords, Chevrolets, and Plymouths, mostly in medium price series.

Chevrolet still is the most popular car for leasing. The trend is toward keeping leased cars longer. The average now runs about 24 months, longer if the cars are driven 15,000 miles or more a year.

• **Three Way Split**—Big Five leasing firms like Peterson Howell & Heather, Baltimore, account for 33 per cent of the leasing business, but car dealers are digging deeper into the field. They are taking 36 per cent of the leases compared with an estimated 28 per cent three years ago. Independent firms pick up the rest.

Many of the dealers are being franchised by the bigger leasing firms. Lee Fleet has signed agreements with over 100 dealers in the last year. Auto companies discourage that approach. They prefer to back their own dealers in leasing ventures.

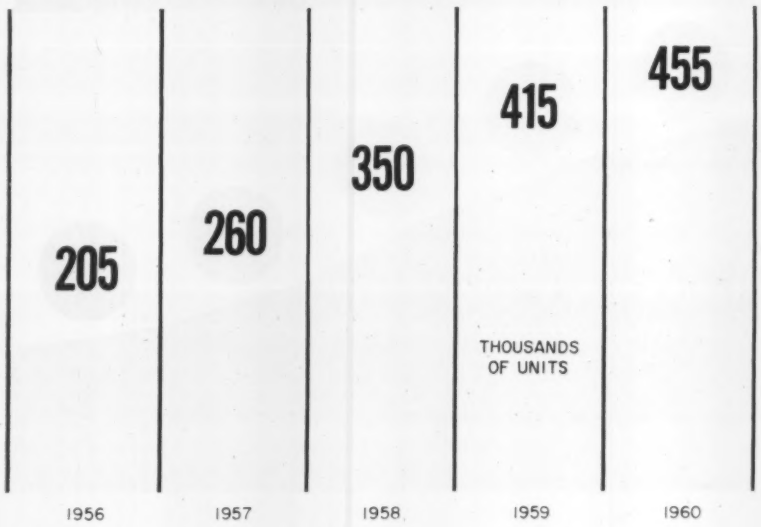
• **Fleet Sales Up** — The boom in leasing is the biggest contributing factor to the surge of fleet sales, which show a 32 per cent gain this year over last. Although rental agencies like Hertz Corp. and Avis Rent-a-Car System are offering a few foreign cars for novelty appeal, Big Three domestic models remain the biggest sellers.

American Motors Corp. has been pushing fleet sales assiduously since 1956. It cites independent insurance company studies that show Ramblers cost $149 to $454 less to buy, operate, and sell than other low priced cars. William B. Ramsey, AMC's fleet sales director, says registrations are running more than 100 per cent ahead of 1958's. They should reach 25,000 units in '59.

Bulk of AMC's sales are to leasing and rental agencies. Its cars seem to be favored by in-city salesmen and utility companies. Although the leasing firms would like to buy more of the economy jobs, they're holding off on large scale purchases until they see how trade-in values hold up. Here's a breakdown on sales averaged over the last two years:

Percentage by Make	
Chevrolet	40
Ford	35
Plymouth	10
Rambler	7
Lark	5
Others	3

Car Leasing Leaps Ahead



Source: Ford Div., Ford Motor Co., surveys and estimates.

Check Costs Before Changing

Despite leasing's gains, you may be better off to stick with company fleets or salesmen owned vehicles. A quick comparison of the merits of each plan should help you decide whether or not you want to call in a leasing firm for a quotation. The checklist accompanying this story will help.

• **Company Fleets**—If your firm operates more than 35 vehicles from a central location where it can maintain its own garage and service facilities, you likely won't want to lease. It should cost you about 7 cents per car per mile to operate a fleet economically. Administrative costs take 1.5 cents. Look at maintenance scheduling and resale practices if your costs are much higher than that. They are key trouble spots.

Managing your fleet is a full-time job for an expert. Don't palm it off as a sideline on an executive who's probably overloaded with regular duties. And remember, buying your own cars is considered a capi-

tal investment for tax purposes.

• **Salesmen Owned**—If your salesmen need "prestige" cars, or if you have only a few persons driving regularly from the home office, it may be wise to let them buy their own cars and reimburse them with mileage payments. Inflation has upped the average mileage allowance—most popular rate is 9 cents (STEEL, Aug. 17, p. 47)—but you avoid all the headaches of fleet ownership.

Two basic problems crop up with salesmen owned cars. 1. You're apt to overpay just to avoid bickering and dissatisfaction. 2. Few salesmen save the depreciation share of their mileage allowance. They often wind up driving four year old cars or else they're perpetually in hock to a finance company.

Incidentally, unless your fieldmen are in the $15,000 a year and up bracket, you might want to tell them that individual leasing seldom pays off except as a convenience. It costs a minimum of $2900 to lease one low priced car for two years. For the same money and in the same period, you can buy a similar model outright and acquire a trade-in equity of at least $1000.

How Leasing Works

If you do investigate leasing, remember that basically all you're doing is turning your fleet problem over to a service organization that specializes in this field. You pay for the service, but it may be cheaper than trying to do it yourself. There are two types of plans.

Flat rate (full maintenance) leasing really is long term renting. Costs average between $110 and $160 a month and should include maintenance, taxes, licenses, and insurance. It works well for less than a dozen cars or for higher priced automobiles.

Amortization programs often are financed under an equipment trust in which insurance companies are investors and hold title to the cars. Total cost of a vehicle including licenses, taxes, and transportation to a salesman's home is capitalized and your firm is billed at a monthly rental rate which includes a predetermined depreciation rate plus service and financing charges. Average cost is $70 a month. The salesman maintains the car, pays for insurance and operating expenses. He may be reimbursed for everything but depreciation at a rate of 2 or 3 cents a mile. The leasing agency replaces the car while its market value is still above the depreciated book value.

Leasing has two major advantages: It saves your capital funds and gives each salesman the kind of car he wants. In seven states, leasing agencies don't pay sales taxes, which saves $60 to $80 per car a year. Best of all, the leasing agency acts as an expert service representative to handle buying, selling, delivery, and all paperwork. It buys at wholesale prices and has its own used car outlets.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, Penton Bldg., Cleveland 13, Ohio.

Vehicle Cost Analysis

(Fill in applicable blanks)

FIXED EXPENSE	Per Year
1. Total capital investment	$
2. Interest on investment	
3. Financing charges	
4. Depreciation	
5. License tags	
6. Property taxes	
7. Fire & theft insurance	
8. PL & PD insurance	
9. Collision insurance	
10. Garage rent & utilities	
11. Garage equipment & supplies	
12. Equipment depreciation	
13. Garage labor & supervision	
14. Officework & administration	
15. Time lost from breakdowns	
16. Road service	
17. Special equipment	
18. Miscellaneous costs	
TOTAL FIXED COSTS	$
Mileage Expense*	
19. Gasoline, oil, grease	
20. Tire & tube costs	
21. Replacement & repair parts	
22. Outside repair costs	
23. Antifreeze & tire chains	
TOTAL MILEAGE COSTS	$
TOTAL COST PER YEAR	$

*Mileage reimbursement may be substituted for salesman owned cars.
Adapted from National Truck Leasing System forms.

Outlook for Heat Treating Equipment . . .

ORDERS
(in 2nd half vs. 1st)

Up 19%

In some areas, like the aircraft and missile industry, buying will jump 50 per cent or more.

ORDERS
(1959 vs. 1958)

Up 53%

Three producers expect gains of 100 per cent. The smallest increase anticipated: 15 per cent.

ORDERS
(1960 vs. 1959)

Up 13%

Estimates range from "up 100 per cent" to "down 10 per cent." It means 1960 orders will exceed 1957's.

Orders Will Dart Up; '60

ONE BIG REASON why metalworking companies are boosting their spending for heat treating—and other—equipment: The more money a company invests, the wider its profit margins will be. Here's proof:

The Treasury Department analyzed balance sheets of 827,916 corporations filing income tax returns during fiscal 1957. The findings: Companies with assets of less than $1 million had average net profits equal to only 1.9 per cent of sales. Firms with assets over $1 million earned an average of 9 per cent on sales. The comparison becomes more dramatic when you examine the range:

Assets (Dollars)	Earned on sales (Percentage)
25,000-50,000	1.2
50,000-100,000	1.9
100,000-250,000	2.4
250,000-500,000	2.7
500,000-1 million	3.3
1 million-2.5 million	4.4
2.5 million-5 million	5.4
5 million-10 million	6.1
10 million-25 million	7.6
25 million-50 million	8.3
50 million-100 million	9.3
100 million-250 million	8.8
250 million or more	11.9

It proves that one of the surest ways to widen your profit margins is through investment in modern capital equipment. It points up a direct relationship between assets and efficiency.

• **Metalmen Know It**—That's why metalworking companies are coming strongly back into the market for capital equipment. For example, they'll spend at least 19 per cent more for heat treating equipment during 1959's last six months than they did in the first half. Some industries (aircraft and missiles, for example) will boost their spending by more than 50 per cent.

• **These Spend Big**—Other industries boosting their spending for heat treating equipment include: Farm equipment, foundry, electrical machinery and equipment, and nonferrous. Some component manufacturers are hiking outlays too. Several makers of fasteners and bearings indicated significant increases in STEEL's midyear survey (July 13, p. 56) of capital equipment spending plans. Steel industry outlays are uncertain due to the strike.

• **Behind the Upturn**—STEEL asked the major producers of heat treating equipment to name the influences that are causing the upturn in orders for their products. The factor listed most often: A need to lower operating costs. A substantial portion of the heat treating (and other) equipment being bought is for modernization rather than for expansion.

Most makers anticipate a booming fourth quarter. They expect a flood of orders as soon as peace is assured in the steel industry.

• **Effects of Strike**—About 1 in 4 makers of heat treating equipment reports it will run short of materials if the steel strike lasts beyond Labor Day.

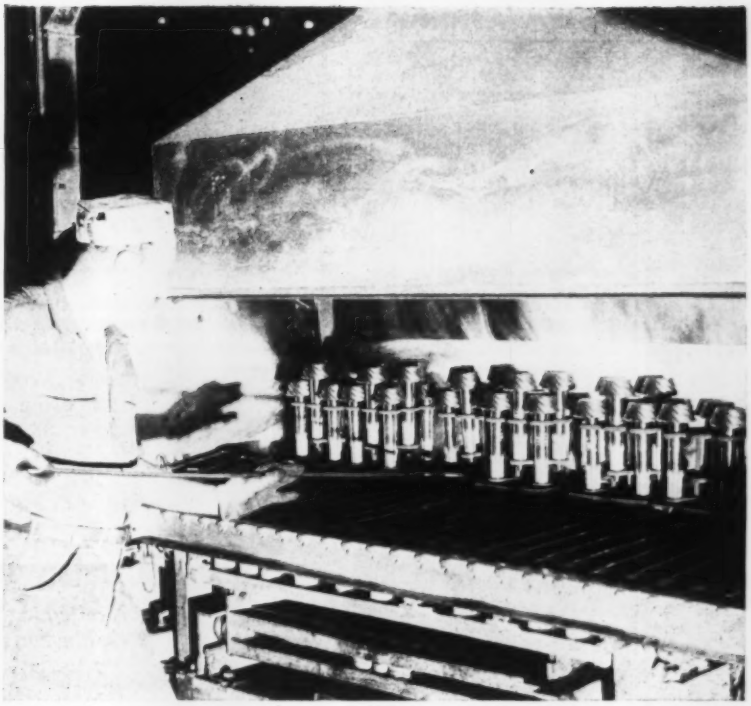
About half the makers believe a six to eight week strike will affect their second half order volume. Two firms report that steel mills are holding back on planned purchases of the equipment. Others report a "wait and see" attitude on the part of some steel users. But most think that the equipment orders are merely being postponed, not canceled. Several expect the strike to cause a "bunching up" of orders in the fourth quarter.

• **Prices**—Price competition prevails in the industry. STEEL asked the producers to classify its severity: 5

PRICES

Up 3 to 5%

About half the makers will hike prices before yearend; others plan boosts next year. Range: 2 to 10 per cent.



to Beat '57

per cent say "mild"; 45 per cent say "active"; 50 per cent say "serious."

The makers are evenly divided on whether it will become more or less severe before yearend.

But many are pushing through price increases in an effort to firm quotations. Nearly half the producers plan to hike prices before yearend. Average boost: 4 per cent. About 3 in 4 makers say they'll lift their charges next year. The range: 2 to 10 per cent.

• **Foreign Competition** — Less than 20 per cent of the producers consider foreign competition a problem in the domestic market. But more than 80 per cent say it's a rugged issue in the export market. Producers in Germany, England, Holland, Belgium, Sweden, France, and Japan are cutting into U. S. makers' export sales. The price differential ranges from 10 to 40 per cent. Twenty per cent is common.

• Extra copies of this report are available until supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio. This is the seventh article in STEEL's new semiannual series on the outlook for capital equipment. It's based on a survey of selected companies representing nearly one-third of metalworking's total spending for capital equipment.

Commercial Heat Treaters to Bill 15% Greater Volume

LOOK FOR commercial heat treaters to do 15 per cent more business during the second half than they did in the first period.

More than half the shops contacted by STEEL expect gains of 20 to 25 per cent. About 1 in 3 shops anticipates second half volume equal to that of the first six months.

• **A Big '59**—It means that 1959 billings will exceed those of 1958 by 41 per cent. That would give the industry a $42.2 million year—vs. $29.9 million last year and $37.1 million in 1957.

• **Best Customers**—The heat treaters tell STEEL that these industries are significantly boosting their billings this year: Aircraft, automotive, fastener, gear, agricultural equipment, construction equipment, foundry, and electrical machinery and equipment. Railroad suppliers and makers of textile industry machinery are also hiking billings.

• **Prices**—Look for relative stability in prices charged for heat treating. Only 1 in 5 shops has boosted quotations in the last six months, and only 3 in 10 plan to raise their charges in the coming six months. The range: 5 to 12½ per cent.

There's considerable price competition among the heat treaters. STEEL asked a dozen industry leaders to classify its severity. None said "mild"; six called it "active"; five termed it "serious"; one named it "critical." They expect it to continue for at least six months. Three believe it will become more severe; two expect it to slacken; seven foresee no change.

Vice President Nixon heads educational move . . .

Cabinet Unit States U. S. Goals

IN THE first of a series of "educational" statements about the nature of the U. S. economy, Vice President Richard Nixon's cabinet committee on price stability for economic growth has answered the question: What do we really want from our economy?

Or, at least, it has answered the question from the point of view of the Republican administration. When the Democratic opposition has to say will probably be forthcoming in a statement from the party's own economic advisory council.

The vice president's committee promises other statements soon on these questions: What is economic growth? What is maximum employment? What is reasonable price stability? How much have prices risen? What is the relation of productivity to wages and prices? And would rising prices threaten our export markets? The next statement should appear within two or three weeks.

Little Fear of Inflation Trends

One surprising result of the committee's first appearance in print: It exhibits little fear that the line against inflation will not be held. The goals of the American people are described as: 1. A large and expanding output of goods and services. 2. Maximum employment opportunities. 3. Reasonable stability of prices.

Within those criteria, the committee doesn't seem to have any trouble about inflation. A source close to the committee notes that since World War II prices have risen only 8 per cent, and that the great bulk of that increase occurred in the 1955-57 period. Rather than the "full" employment expression of economists usually attached to the Democratic standard, the vice president's committee has chosen the difficult-to-pin-down phrase "maximum employment opportunities." Instead of naming a figure by which the U. S. economy should expand on an annual basis, the committee has seen fit to note that output should "expand." Presumably, the 8 per cent increase in prices since World War II qualifies as "reasonable."

Examined specifically for the relation of steel prices, for example, to the problem of an expanding economy —or steelworkers' wages—the committee's statement appears to contain little more than the ordinary sort of politicking you can expect from Washington. On the other hand, the vice president has clearly indicated his ideals. Perhaps, practical solutions to the economic problems that face us shouldn't be expected from such a source.

Secretary Mueller Pulls No Punches

A refreshing experience in Washington circles: Frederick Mueller, new secretary of commerce, fielded some pretty tough questions at his first press conference last week, and exhibited all the signs of being a strong cabinet official.

• **The Steel Picture**—No freeze will be put on steel service centers (warehouses) until their inventories have dropped below 50 per cent of what they had stocked at the beginning of the strike. Secretary Mueller estimated warehouse stocks were being used up at the rate of 130,000 to 150,000 tons a week. At the start of the strike, about 3.5 million tons of steel were in the warehouses, he said.

He expects no difficulty in supplying defense type steels to defense contractors.

• **Taxes**—The secretary thinks it unfair that only a few industries carry the excise tax. If the revenue is needed, he thinks taxes should be levied on all manufacturers, not just a few. It is not inconceivable, he implied, that a general tax cut could be made within a "short period."

B-L-H Finally Wins TVA Contract

The Tennessee Valley Authority has opened recent bids for hydraulic turbines and found that Baldwin-Lima-Hamilton Corp.'s offer is apparently lower than those of another domestic producer of heavy electrical equipment and a foreign producer, English Electric Co.

B-L-H was able to bid $25,000 below the English company on a package of two turbines and about $40,000 below on a package of three turbines. TVA will grant contracts on either package, depending upon its power needs.

B-L-H's bid for the three turbine package was $2.3 million. The firm has, in some cases, run 30 per cent above bids of foreign firms for government work.

STEEL will report the details of B-L-H's successful bid.

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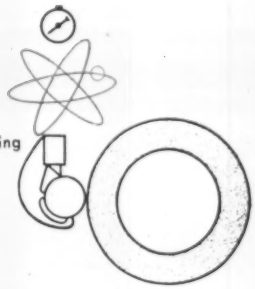
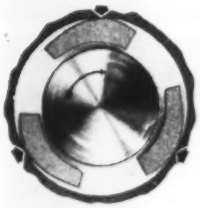
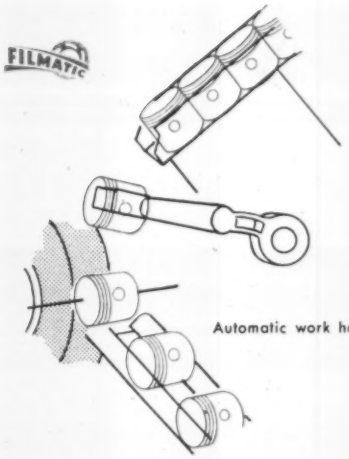


Air-electric gage sizing



FILMATIC spindle bearings



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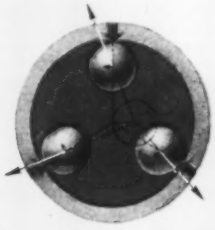
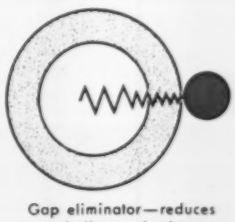
Automatic wheel balancing





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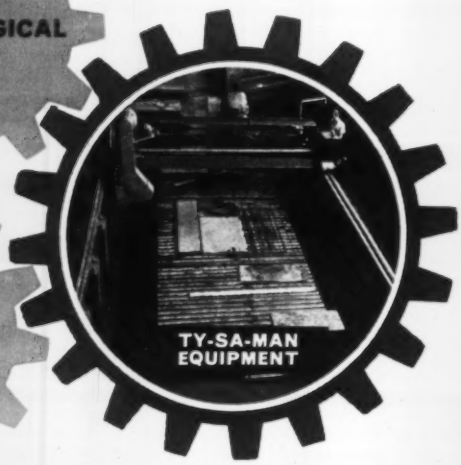
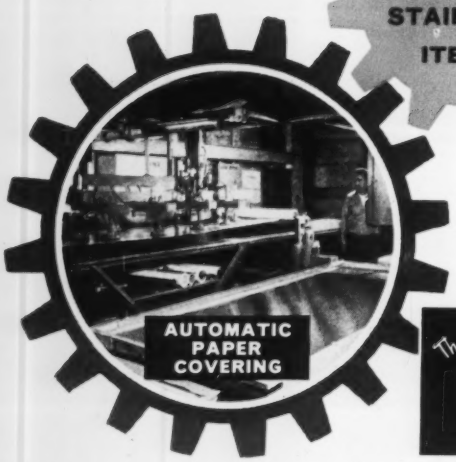


ORDER DESK KNOW-HOW

WIDE VARIETY OF STAINLESS ITEMS



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How to Ship Small Parcels

Here's the short, sad tale of a company that wasn't "in the know" on dispatching such packages. It found it pays to be aware of the services available and their advantages

A CHICAGO FIRM ordered a 10 lb replacement part from a Cleveland partmaker. Although air shipment could get the part to Chicago within 4 hours, the manufacturer deemed the charges excessive when it could ship by parcel post for 70 cents (see accompanying comparisons). On a well-traveled route, the mail car was filled quickly and in Chicago the next day.

A short time later, a shop in a small southeastern Ohio town needed a similar part in a hurry. The Cleveland firm again shipped by parcel post. The destination, though only 120 miles from Cleveland, was neither on a direct nor well-traveled mail route. It was nearly a week before the package got to the distraught ex-customer. The shipper investigated, found that for a few cents extra Greyhound's Package Service would have had the parcel at a convenient dropoff point within 6 hours. Moral: The best way to send small packages varies from town to town.

Here is a brief description of eight commonly used methods of small package shipment. Trafficmen advise: Be aware of the advantages of each method to know which service best suits your needs at a given time. Check locally for additional "fringe" benefits and special rules.

• **Air Express**—Operates seven days a week. Door-to-door pickup and delivery. Free insurance up to $50 valuation. Package size and weight limitations: None on small shipments; advance notice required for odd shaped packages.

• **Air Freight** — Operates seven days a week. Package must be taken to and picked up at airports. Upon request, consignee will be called when package arrives at destination. In some areas, pickup and delivery service is offered at extra cost. Insurance cost is extra. Package size and weight limitations: Same as air express.

• **Greyhound Package Service**—Operates seven days a week. Packages must be taken to and picked up at bus depots. In some areas, gas stations or the like are designated dropoff points. Consignee is called when package arrives at destination. Insurance to $100 valuation is free. Package must not exceed 100 lb or 24 x 24 x 48 in. Other bus companies may offer similar services.

• **Parcel Post**—Operates only during Post Office hours. Packages must be taken to Post Office or mailbox. Delivery is to consignee's door. Unless sent by special handling (at extra cost), delivery time may be uncertain because shipments are not made until mail car is full. Insurance is extra. Package must not exceed 70 lb or 100 in. in length and girth combined.

• **Rail**—In many areas, five day a week local pickup and delivery service is offered. Otherwise, package must be taken to freight station. Over-the-road service operates seven days a week. Insurance is included in shipping charge. Package size and weight limitations: None.

• **Railway Express** — Door-to-door pickup and delivery service operates five days a week. Over-the-road service operates seven days a week. Insurance coverage is the same as that for air express. Package size and weight limitations: None.

• **Truck**—Door-to-door pickup and delivery service. Local service generally is limited to five days a week. Over-the-road service operates seven days a week with larger truckers. Service will vary from trucker to trucker. Insurance is included in shipping charge. Package size and weight limitations: None.

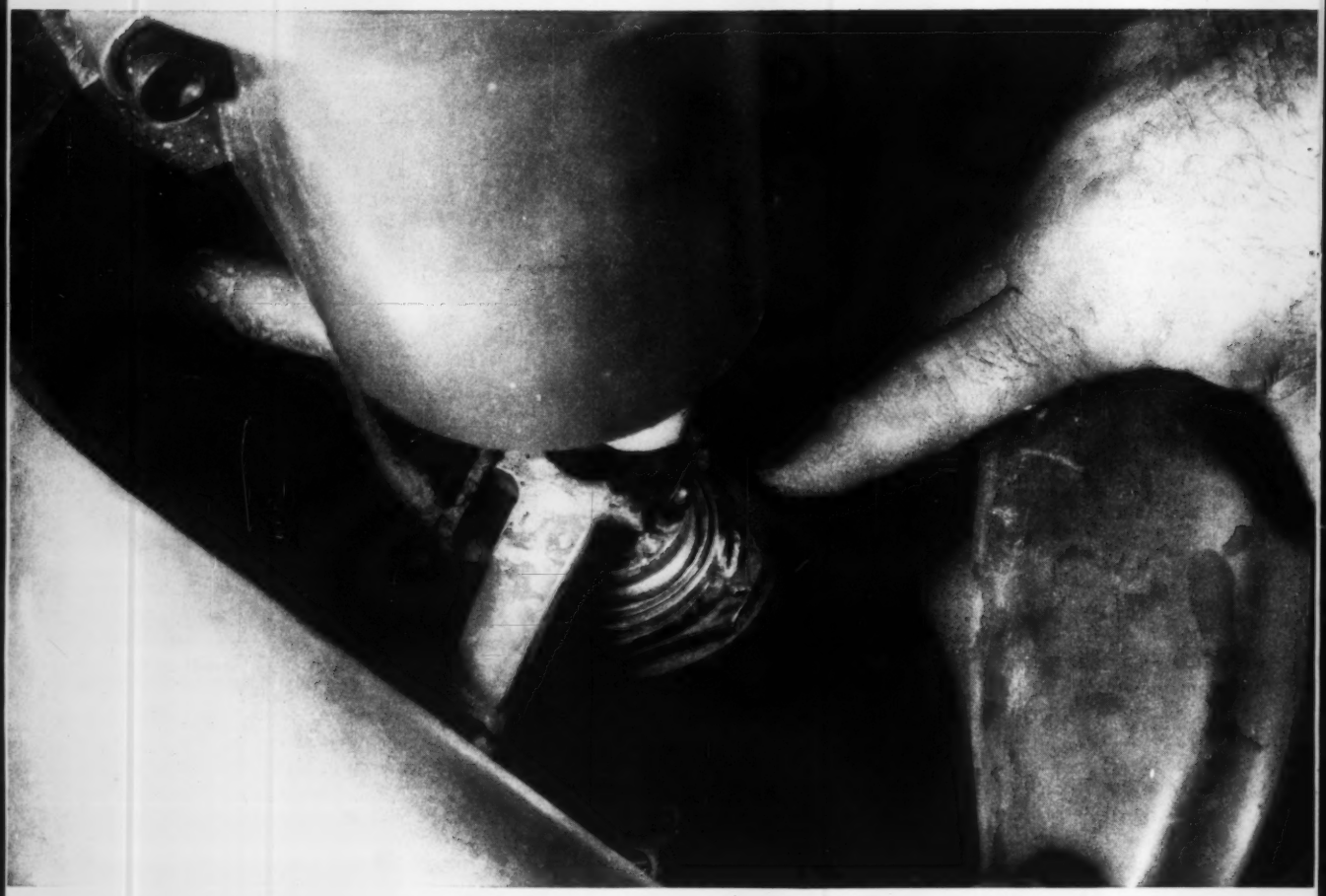
• **United Parcel Service** — Doesn't generally have interstate rights (except in ICC commercial zones), but offers five day a week intrastate and local service in areas served. Has door-to-door pickup and delivery. Daily service can be arranged for regular shippers. Insurance up to $100 valuation is free. Package must not exceed 70 lb or 120 in. in combined length and girth.

Cost of Shipping a Package from Cleveland to Chicago

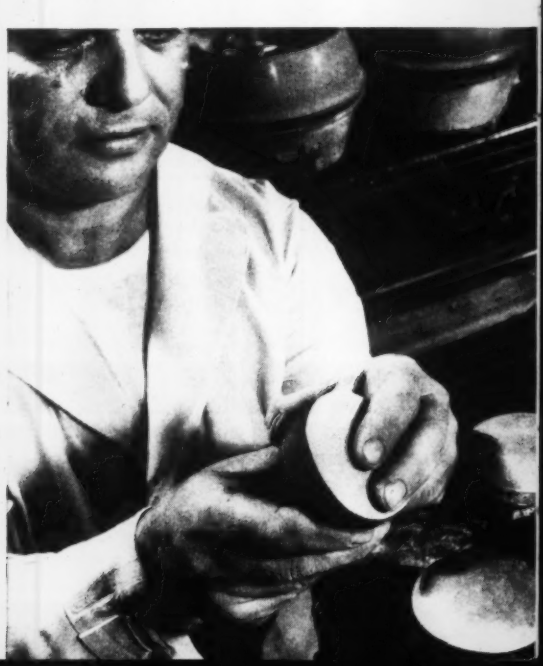
	10 lb	50 lb	100 lb
Air Express	$3.50	$6.10	$10.20
Air Freight	4.00	4.00	5.26
Greyhound Bus	1.75	2.80	4.20
Parcel Post	.70	2.76	**
Rail	3.06	3.06	3.06
Railway Express	2.70	5.14	8.21
Truck	3.94	3.94	3.94
United Parcel	*	*	**

*Does not have interstate rights here. In areas served, rates are comparable with parcel post.
**70 lb weight limit.

How NS solved another special steel problem



LENS GRINDING—the intermediate grinding stage, called "fining" is done on this type machine. The square piece of optical glass, with corners trimmed away, is mounted on an overhead chuck which bears down on the fining tool. The fining tool surface is covered with a round piece of wire cloth (man's finger is touching edge of wire cloth) which carries the emulsified emery abrasive used in grinding the lens.



WIRE CLOTH disk is laid over tool surface and pressed down. Pressure-sensitive backing holds wire cloth to tool surface during grinding operation.

NS-REYNOLDS WIRE CLOTH CUTS ERRORS FOR LENS MANUFACTURER

A leading manufacturer of ophthalmic and corrective eye glass lenses has eliminated tool wear, reduced lens grinding error and cut production time with a new integrated surfacing system for grinding tools, utilizing National-Standard Reynolds wire cloth as an abrasive carrier on the tool surface.

NS SOLVES A PROBLEM—Before the addition of the wire cloth tool facing, it was necessary to regrind the lens fining tools after every 3 or 4 lenses—a time consuming, costly procedure. The lens manufacturer came to the Reynolds Wire Division of National-Standard for help in finding a wire cloth with the high-degree of uniformity necessary to serve as a facing for the grinding tools. Reynolds Wire engineers recommended 0.007-inch, electrogalvanized steel wire woven to 30x30 mesh. Wire diameter was held to within a 0.00015-inch tolerance.

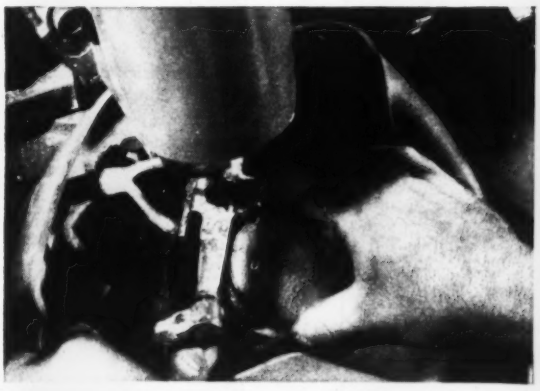
Under testing by the lens manufacturer, it was found that the wire cloth's uniformity allowed precision in grinding that virtually eliminated re-working. Grinding tools no longer needed re-truing, human error in finishing was eliminated, and the wire cloth held the grinding abrasive uniformly across the tool face for greater accuracy.

EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire is available to you from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

Manufacturer of Specialty Wire for Rubber Products

NATIONAL NS STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY**, Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL**, Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE**, Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS**, Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



GRINDING TOOL with wire cloth layer is inserted into bottom chuck of fining machine. Chuck rotates the tool for about 8 minutes during fining operation.

LENSES go through fining operation in one of four machines shown in the foreground before being polished in machines at the rear. The addition of wire cloth has also cut the fining operation time.

a new, improved ALODINE for aluminum

Cost Saving, Time Saving ALODINE 1200S Pre-Paint Treatment Protects Aluminum Best!

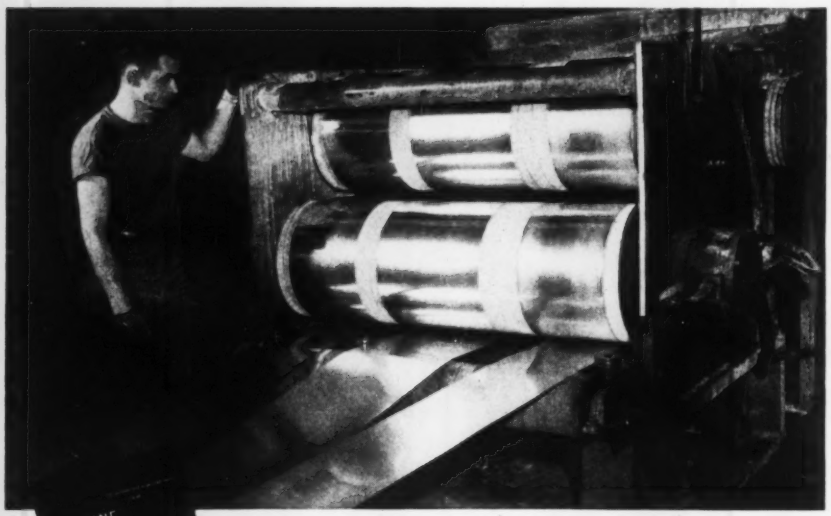
IN LESS TIME—ALODINE 1200S provides increased chemical activity for dramatic reduction in processing time . . . up to 50% in most cases! You get far faster processing than ever before, with the same high quality protection!

WITH LESS EQUIPMENT—You can install an ALODINE 1200S system quickly and conveniently, *without resorting to mechanical bath maintenance!* That means no dangerous, time consuming checking routines with the possibility of bath contamination always present!

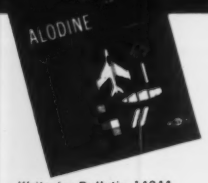
AT LESS COST—ALODINE 1200S can be processed through continuous dip in the same time cycle other conversion coatings require for continuous spray lines! This dip technique reduces initial equipment costs, slashes maintenance costs to a minimum and allows aluminum fabricators to utilize conversion coatings more frequently for a wider range of product applications! Whatever the application method—brush, dip, continuous strip or spray—ALODINE 1200S may be the answer to your production problems.

FOR MORE FLEXIBILITY—Most important, its ease of operation, safety in use and versatility enables ALODINE 1200S to answer one of the most perplexing problems inherent in providing corrosion protection and paint bonding qualities for aluminum—the problem of constant, uniform quality. ALODINE 1200S is qualified under Government Specification MIL-C-5541.

Investigate cost saving, time saving ALODINE 1200S today! And whenever you have a chemical finishing requirement for aluminum—any type of aluminum—there's an ALODINE process available to protect or decorate the metal, and anchor the paint finish more securely.



Typical ALODINE 1200S strip line installation at ALSCO, INC. Strip from aluminum coil is fed into Alodine processing baths where it is cleaned, rinsed, deoxidized, rinsed, coated with ALODINE 1200S, rinsed and given a final acidulated rinse. Strip is then rewound, roll coat painted, roller formed into final shape, backed, inspected and packed for final shipment.



Write for Bulletin 1424A describing use of Alodine for aluminum fabrications of all types.

AMCHEM

ALODINE 1200S

another chemical development of **AMCHEM PRODUCTS, INC., Ambler 27, Pa.**
(Formerly American Chemical Paint Co.)

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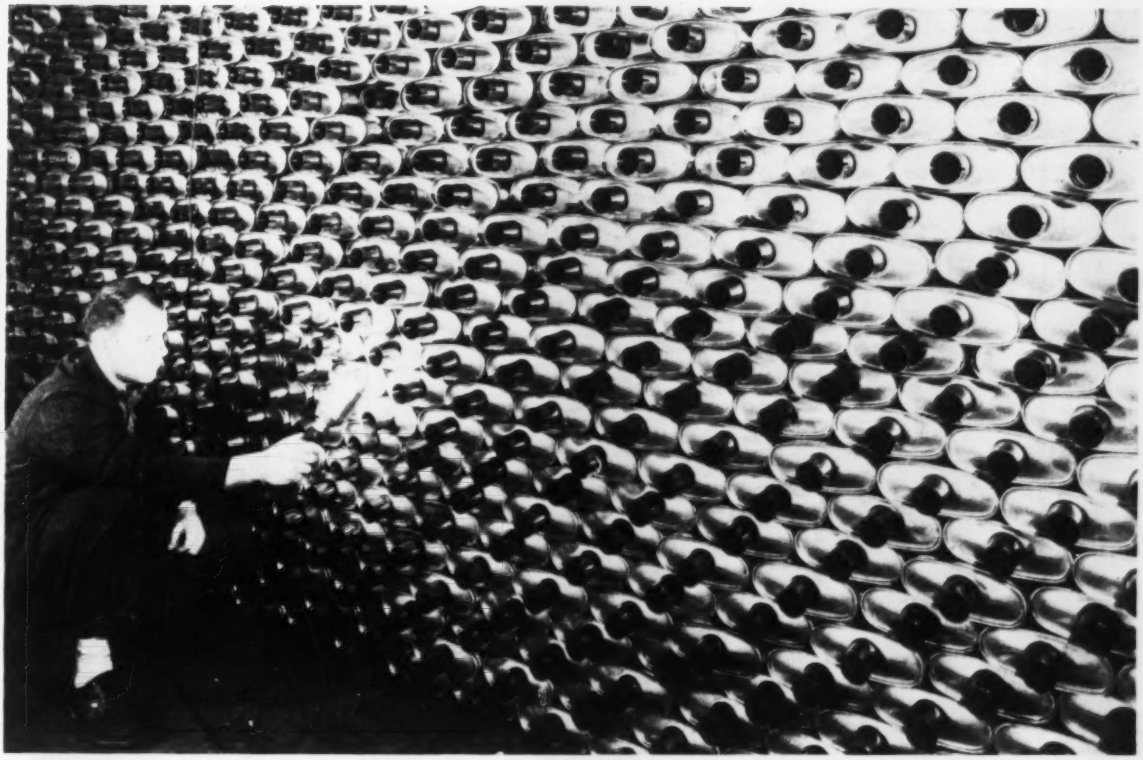


A stack of new auto mufflers get checked at AP Parts Corp.

Builder Makes a Tougher Muffler

MORE IDEAS are developing in the construction and design of auto muffler and exhaust systems as the auto industry wrestles one of the peskiest problems in motoring.

Some new departures are already showing up on Detroit drawing boards (STEEL, July 13, p. 69). Major automakers are designing experimental cars with front-mounted mufflers which should last longer and should eliminate the complicated and troublesome tailpipes and resonators of today's cars.

• **Zinc Steel for Mufflers**—AP Parts Corp., Grand Haven, Mich., is expanding its use of JalZinc, Jones & Laughlin Steel Corp.'s zinc coated steel sheet, to produce a tougher, longer lasting replacement muffler. AP engineers report that the zinc galvanized steel retains its anticorrosion qualities throughout fabricating and spotwelding operations.

A ceramic-coated muffler, with a 100,000 mile "lifetime" warranty, has been produced, tested, and offered to major auto companies by the Bettinger Corp., Milford, Mass. Tests by truck builders show refractory coatings double muffler life.

Muffler and exhaust pipe life has dropped steadily since the introduction of V-8 engines with dual exhaust systems. Present high octane gasolines produce more reactive acids than other motor fuels; the more efficient cooling of higher horsepower engines produces cooler exhaust gases which in turn leave condensed acidic moisture on cold muffler surfaces; short run, city driving leaves corrosive, condensed vapors to eat away metal surfaces.

• **State Laws a Problem** — State statutes may slow some new ideas in exhaust design where they require that fumes be expelled behind the auto. On the other hand, California legislators are considering a law to curb auto exhaust emissions as a source of smog. That move could encourage radical developments in muffler and exhaust systems.

Periscope for Rear View?

You'll be able to use a periscope to see everything coming at you from the rear without having to crane your neck to look around blind spots in your car if Detroit buys the device. It has been de-

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

PILLOW TANKS like this can be used for transportation of virtually any kind of liquid. They're made by the Aviation Products Div., Goodyear Tire & Rubber Co. The rubber coated nylon containers are extremely durable, easy to handle, and can be rolled up and stored in a box when not on the road. They can be made to fit any size vehicle

veloped by American Optical Co., Southbridge, Mass.

The rear view is picked up through a 24 in. long cylindrical lens set in the roof of the car over the back window. Another lens and a mirror reflect the images into a rear view mirror, 2¼ x 9 in. long, that's mounted inside in a hood over the windshield on the driver's side of the car.

Dr. Lewis Hyde, American Optical's research director, says the periscope gives greater field of vision and eliminates blind spots caused by car design, rear seat passengers, and packages on the rear shelf.

On prototype roofs, the flat periscope housing is almost flush with the roof line. The rear opening appears as a rectangular louver just above the back window. Biggest problem (aside from the estimated $60 cost) is that auto engineers will have to redesign car roofs to incorporate the unit. That may take some doing.

Truckers Cut Accidents

Major commercial and government fleets averaged only 14 accidents per million miles of travel last year. That's less than a third the rate of 45 per million ten years ago, claims the Automobile Manufacturers Association.

The association points out that truckers today average 71,000 miles without accidents compared with 22,000 in 1948. The accident rate for all vehicles last year was 26.5 per million miles of travel, or 37,700 miles between mishaps.

At least six areas of truck design improvement have helped reduce the accident rate.

1. Durability is greater, so trucks can run between 100,000 and 300,000 miles without major repairs.
2. Brake life has increased. It now averages 35,000 miles for city driving, 150,000 for highway operations.
3. Vision is better because of increased glass areas in cabs and improvements in windshield washers, defrosters, mirrors, and headlights.
4. Weight to horsepower ratios are improved so trucktrailers can keep up with normal traffic flow and maintain safer speeds on hills.
5. Automatic transmissions, power steering, and power brakes have helped in improving control.
6. Driver fatigue has been lessened by making trucks more comfortable (better shock absorbers, springs, seats, and ventilation systems). Muffler developments have reduced fatigue from noise.

U.S. Share in Market Up

Domestic carbuilders claimed 62 per cent of the world's automobile production in 1957. They took 69.4 per cent in 1956. Before that, the average share per year was 72 per cent. It slipped to 49 per cent last year as European builders experienced booming production at the same time the recession riddled U. S. auto sales. Now *Ward's Automotive Reports* says it looks like Uncle Sam's take will bounce back toward 60 per cent by yearend.

While this is encouraging, it does not mean that domestic automakers are regaining their export markets. Automobile imports exceeded exports for the first time in 1957. Since then, imports have continued to climb while exports have dropped rapidly. Imports now are three and a half times greater than our outbound car shipments. With an estimate for this year, *Ward's* gives this statistical import-export breakdown:

	Exports	Imports
	(Thousands of units)	
1959	145	490
1958	126	431
1957	160	259
1956	193	108
1955	254	57
1954	206	34
1953	186	27

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
7 Mo. Totals	3,839,380	2,563,365
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
July 18	127,502	85,533
July 25	124,446	85,519
Aug. 1	122,518	62,846
Aug. 8	108,240	65,614
Aug. 15	72,745†	59,677
Aug. 22	30,000*	25,918

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Photo courtesy of National Screw & Mfg. Co.

COLD HEADING . . . every bolt a check on Aristoloy uniform quality

Bolts by the thousand or by the million . . . profitable cold heading requires steel of uniform structure and chemistry. Steel that can be formed to close, consistent dimensions and better surface finish . . . steel of good hardenability and heat treating characteristics.

Aristoloy electric furnace steels will meet your cold heading stock requirements . . . are ideally suited for most cold headed products.

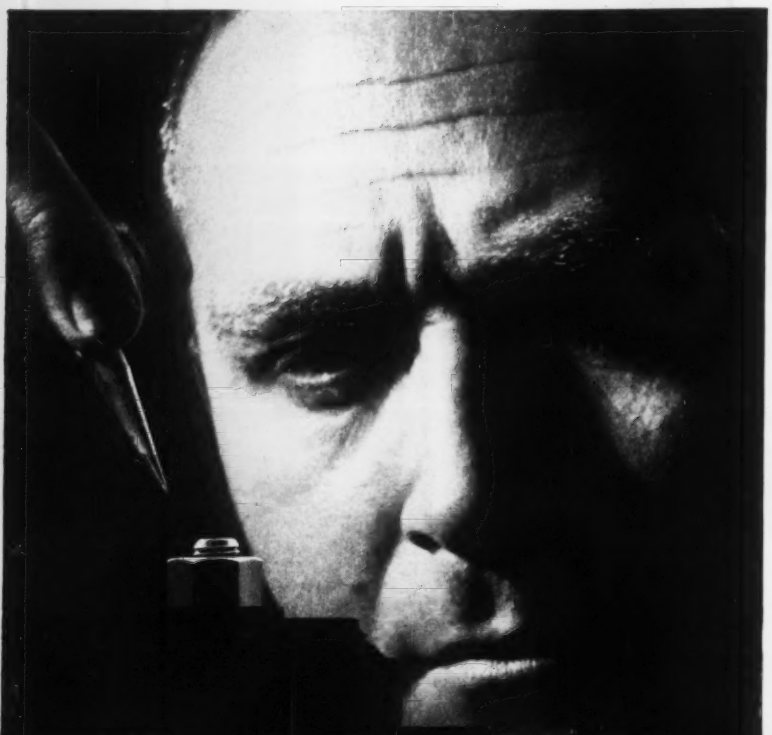
For complete information about Aristoloy steels, carbon, alloy, stainless or leaded, call the Copperweld representative in your nearest large city . . . or write for NEW PRODUCTS and FACILITIES CATALOG.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4005 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

ECONOMIC FACTS ON FASTENERS



Where to look for hidden savings

- **Fastener value-analysis shows big dollar savings**
- **Quality improved at same time**

If you know what to look for, there are sizable savings to be found in standard fasteners. See what happened when the *RB&W Fastener Man* analyzed fastener usage:

Shown the merits of high strength bolts, a company standardized on them exclusively, saved $12,000 the first year, $28,000 the next.

Showing a manufacturer how to substitute high strength bolts for heavy head milled bolts, the RB&W Fastener Man pointed to a $4,500 annual saving on this item alone.

At a plant with 23,000 different fastener items in inventory, more than half were eliminated...cutting costs from buying to assembly.

Where special fasteners were used in heavy equipment, substituting cap screws offered $13,000 saving on a production run of 500 units.

So it goes. Using high carbon cap screws where costlier socket screws are not really needed . . . cap screws for studs and nuts in certain applications . . . replacing machined parts with cold headed pieces . . . there are plenty of ways to economize.

Take a look at your own fastener usage through the eyes of an RB&W Fastener Man. Contact Russell, Burdsall & Ward Bolt and Nut Co.

RB&W
115th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

Superior joints in heavy duty products

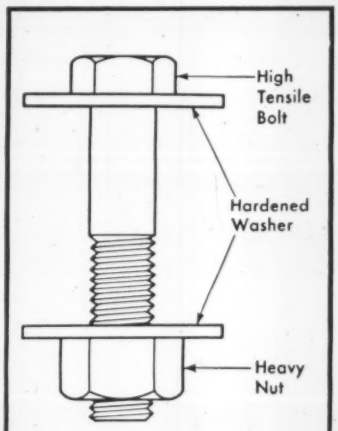
...achieved with RB&W High Strength Bolts

Plenty of experience now proves you can stop fastener failures with high strength bolts. Especially in products subjected to much vibration in service. Properly tightened, these bolts make the joints not only *permanently* tight, but *stronger*.

Here's why: A joint is only as strong as the *residual tension* left in fasteners after tightening. The more you tighten, the better it is.

RB&W High Strength Bolts allow a high level of tightening. Friction between bolted surfaces increases with the tightening, so that slippage of the joined members against each other can't take place. This makes the joint better able to resist external forces which try to shear or separate the joint.

In addition, with high residual tension, these fasteners are also more immune to the fatiguing and loosening effects of loads which constantly vary, such as vibration.

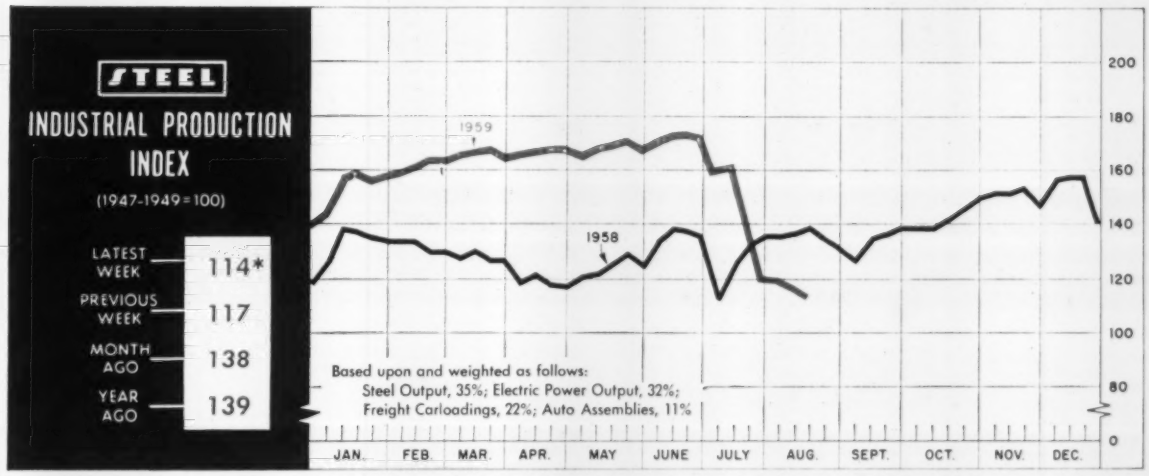


RB&W High Strength Bolts conform to ASTM A325. They're made of a selected grade of high carbon steel for proper balance of hardness and ductility. Use of hardened washers distributes their high clamping force over larger area.

As a result, one manufacturer of heavy duty shaker equipment has found them the only answer in troublesome joints which formerly required constant maintenance. Others are ending rivet failure and costly replacement in cranes, ore unloaders and freight cars with RB&W High Strength Bolts.

If you're making similar or related heavy duty equipment, talk it over with an RB&W Fastener Man.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Aug. 15.

Index Belies Economic Strength

WITH FIVE WEEKS of steel strike on the record, there is still no serious threat to the nation's economy. Although scattered signs of creeping paralysis are appearing (see Page 45), few businessmen outside the steel and directly related industries feel that any big problems will arise until after Labor Day—if the strike lasts that long.

Almost all the initial decline in STEEL's industrial production index (above) has been caused by the sharp drop in steel operations and the resulting losses in freight carloadings.

• **Untouched** — Elsewhere you'll find that the recovery from last year's recession is still in full swing. Shipments of goods other than coal, coke, ore, and steel mill products have remained strong. Output of electric power has been setting weekly records, partly because of unusually high industrial activity and partly because of the ever increasing use of air conditioners. The automotive sector, which accounts for most of the decline in the index during the last two weeks, is entering a perfectly normal model changeover operation, with no ill effects from the steel strike.

The Federal Reserve Board's industrial production index shows somewhat the same thing. During July (half of which was affected by the strike), the seasonally adjusted index dipped only 2 points to a preliminary 153 (1947-49=100), almost entirely because of the steel walkout (see graph and table, Page 68). Production of other durable goods continued its 15 month advance, and nondurable goods output hit a record high. As strikes in other basic industries cut primary metal production further, the overall index will continue its down slope in August, but the loss will be small.

• **Top Dog**—The consumer is not to be shaken out of his spending mood. Coming up to the strike,

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	340[1]	335	1,690
Electric Power Distributed (million kw-hr)	13,700[1]	13,675	12,851
Bituminous Coal Output (1,000 tons)	6,850[1]	7,185	7,923
Crude Oil Production (daily avg—1,000 bbl)	6,800[1]	6,789	6,839
Construction Volume (*ENR*—millions)	$412.4	$411.7	$336.9
Auto, Truck Output, U. S., Canada (*Ward's*)	84,899[1]	119,689	75,687
TRADE			
Freight Carloadings (1,000 Cars)	535[1]	532	626
Business Failures (Dun & Bradstreet)	274	252	290
Currency in Circulation (millions)[3]	$32,071	$31,925	$31,291
Dept. Store Sales (changes from year ago)[3]	+9%	+6%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,093	$24,139	$21,243
Federal Gross Debt (billions)	$288.1	$288.5	$278.0
Bond Volume, NYSE (millions)	$30.3	$28.0	$24.1
Stocks Sales, NYSE (thousands of shares)	13,880	12,768	14,622
Loans and Investments (billions)[4]	$105.1	$105.5	$95.5
U. S. Govt. Obligations Held (billions)[4]	$29.6	$30.2	$34.2
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	246.65
STEEL's Nonferrous Metal Price Index[6]	217.7	217.4	198.1
All Commodities[7]	119.2[1]	119.2	119.0
Commodities Other than Farm & Foods[7]	128.2[1]	128.2	126.0

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

WHAT'S
DIFFERENT
ABOUT
BRMCO

If you buy aluminum, brass or bronze in strip and rolls, you may think all suppliers are alike. They're not. No one supplier can be all things to all people, and few try. If you are the type of buyer who looks for something a little "extra" in quality, workability and service, you might make it a point to learn more about BRMCO. With BRMCO metals, uniformity of width, gauge and grain size results in greater efficiency and lower metal working costs. For example, BRMCO can hold temper tolerances to within plus or minus 3 points on the Rockwell scale.

Apart from just plain better quality metals, you can count on these "plus" services: *specific date delivery, even special packaging or shipping arrangements to suit your individual requirements.*

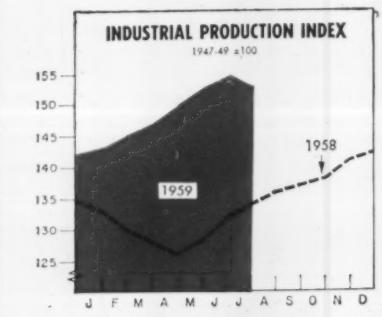
The man from BRMCO can tell you the rest of the story, including information on our own special alloys for unusual requirements.

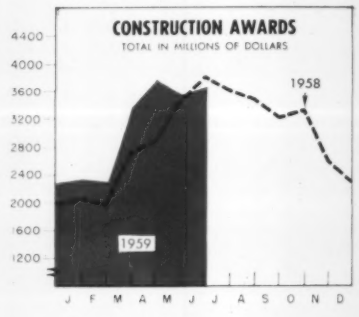
We'll be happy to send you samples for your own testing and analysis. Simply write, or call collect.

BRMCO

Bridgeport Rolling Mills Company
BRIDGEPORT, CONNECTICUT
Subsidiary of Atlantic Coast Industries, Inc.
FINE QUALITY ALUMINUM, BRASS AND BRONZE IN STRIP AND ROLLS

THE BUSINESS TREND





(Seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1959	1958	1959	1958	1959	1958
Jan.	143	133	125	100	166	159
Feb.	145	130	138	95	168	153
Mar.	147	128	146	91	170	150
Apr.	150	126	149	86	173	146
May	153	128	154	91	178	148
June	155	132	150	103	184	151
July	153*	134	113*	102	187*	154
Aug.	...	136	...	109	...	156
Sept.	...	137	...	113	...	155
Oct.	...	138	...	123	...	155
Nov.	...	141	...	123	...	163
Dec.	...	142	...	123	...	165
Avg	...	134	...	105	...	155

Federal Reserve Board. *Preliminary.
Charts copyright, 1959, STEEL.

	Total		Building	
	1959	1958	1959	1958
Jan.	2,319.2	2.060.0	1,839.7	1,530.2
Feb.	2.307.0	1,953.4	1,777.4	1,478.1
Mar.	3.339.9	2,721.2	2,453.9	2,037.7
Apr.	3.778.4	2,881.0	3.018.0	2 198.0
May	3,541.9	3,402.6	2,748.8	2,470.3
June	3,659.0	3 819.6	2,816.9	2,340.3
July	.....	3.607 1	.....	2.633.5
Aug.	.....	3,466.6	.....	2.529.5
Sept.	.....	3,215.9	.....	2.352.5
Oct.	.....	3 309.0	.....	2,549.8
Nov.	.....	2,593.9	.....	1,980.8
Dec.	.....	2,281.9	.....	1,728.6
Totals	....	35,312.2	.....	25,829.3

F. W. Dodge Corp.

buyers were in the best position ever to turn this recovery into a full fledged boom. During the first half of the year, they swelled retail sales to a peak of $103.2 billion, up 8.8 per cent over the corresponding period of 1958. Never before has the year-to-year gain been so great. Even during strike plagued July, personal income reached an incredible $384.1 billion (annual rate).

The appetite of consumers for high cost items continues despite the strike. In the first ten selling days of August (the third week of the strike), they bought 15 per cent more automobiles than they did in the similar period of July. And last month was the best July since 1950 for new housing starts. The annual rate was 1,350,000, just under the pace of June.

No Sign of Panic

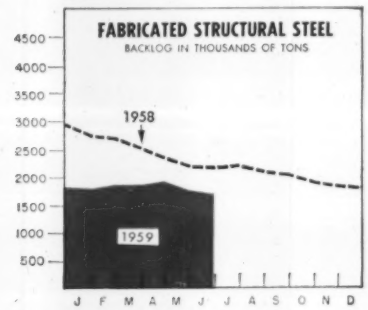
Morgan Guaranty Trust Co. of New York says there has been no psychological repercussion of any consequence so far, either in consumer or business attitudes. Even if the strike goes past Labor Day, the bank declares it will not take the momentum out of the business boom. "General economic indicators are bound to be affected to some extent, but . . . the impact will be minor." Two signs point this way: 1. First half advances were both sharp and broadly diffused. 2. By midyear, no demonstrable excesses had emerged anywhere in the economy.

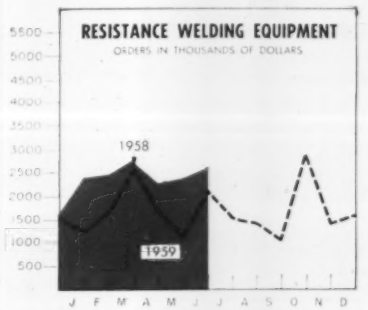
Two other factors will give the economy a fillip in the fourth quarter: 1. A rebuilding of steel inventories depleted by the strike. 2. Production of new model autos. They could temporarily produce a boom atmosphere which could lead to excesses, the bank warns.

The First National City Bank of New York feels that the net result could be a gross national product of half a trillion dollars (annual rate) by the end of 1959.

New Strikes Crop Up

Steel is not the only industry beset with strike woes. Last week the copper industry was faced with a shutdown covering about 75 per cent of domestic operations. At press time, there was little likelihood of a settlement between producers (Anaconda Co. and Phelps Dodge Corp.) and the International Union of Mine, Mill & Smelter Workers. Kennecott Copper Corp. and Magma Copper Co., were al-





	Shipments 1959	Shipments 1958	Backlogs 1959	Backlogs 1958
Jan.	224.3	316.7	1,794	2,778
Feb.	216.1	282.6	1,864	2,727
Mar.	260.5	336.6	1,873	2,542
Apr.	290.6	323.6	1,922	2,387
May	294.1	328.2	1,768	2,211
June	365.4	329.2	1,717	2,191
July	....	290.8	....	2,220
Aug.	....	298.0	....	2,119
Sept.	....	313.7	....	2,047
Oct.	....	307.1	....	1,913
Nov.	....	271.1	....	1,839
Dec.	....	266.6	....	1,809
Total	....	3,664.2		

American Institute of Steel Construction.

	Net Orders 1959	Net Orders 1958	Shipments 1959	Shipments 1958
Jan.	2,396	1,243	1,427	1,422
Feb.	2,457	1,683	1,889	1,615
Mar.	2,811	2,550	2,179	1,659
Apr.	2,258	1,684	2,193	1,963
May	2,407	1,121	2,019	1,750
June	2,648	2,113	2,755	2,346
July	....	1,534	....	2,342
Aug.	....	1,431	....	1,419
Sept.	....	1,060	....	1,125
Oct.	....	2,885	....	1,559
Nov.	....	1,409	....	1,102
Dec.	....	1,554	....	1,357
Totals	....	20,258	....	19,659

Resistance Welder Manufacturers' Assn.

ready struck by United Steelworkers of America and Mine-Mill Workers.

Makers of pumps, compressors, and similar heavy equipment also face labor trouble. Worthington Corp. officials and Steelworker leaders late last week still had not come to terms. The extended deadline is tomorrow midnight (Aug. 25). The outcome is expected to influence such producers as Fairbanks, Morse & Co., Chicago Pneumatic Tool Co., and Cooper-Bessemer Corp., whose USW contracts are coming up for renewal in the near future. The industry employs 25,000 to 30,000 persons.

Appliance Industry Warned

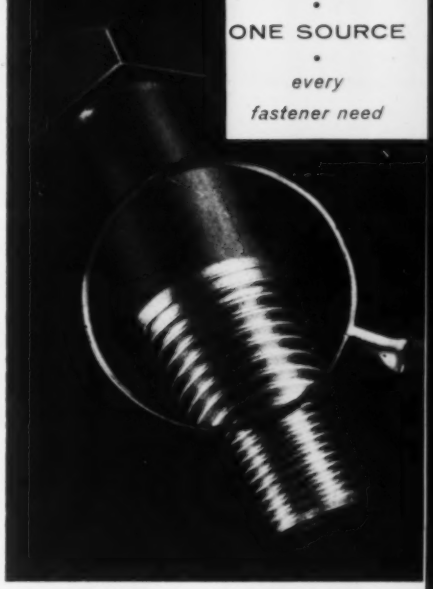
In the middle of one of the best years in its history, the appliance industry is warned that it isn't keeping pace with the rest of the economy. John W. Craig, vice president and general manager of the Electric Appliances Div. of Westinghouse Electric Corp., claims that even though appliance sales have gone up 11 per cent in the last five years, the industry's share of consumer spending has declined 14 per cent. "Had we kept our share . . . we could be selling double the number of dryers and electric ranges, or 2 million additional refrigerators annually," he declares.

He says "price" selling has caused the annual rate of appliance dealer failures to double since the midfifties and cause consumers to buy other items. "We have seen more families become boat owners than owners of dishwashers, garbage disposers, and room air conditioners combined . . . During the fabulous growth expected in the sixties, our industry can probably show record sales each year. Yet our share of the total disposable dollars can be diminishing dangerously . . ."

Some records are being set now. Frigidaire Div. of General Motors Corp. reports that July was the biggest sales month in its history. And from the Gas Appliance Manufacturers Association comes the prediction that the sales boom of the first half of 1959 will continue through the second half and into 1960, setting records for several products.

If individual manufacturers' plans materialize, potential unit sales of gas appliances in 1960 could be: Ranges, 2,276,700; water heaters, 3,455,000; central heating equipment, 1,482,300; vented recessed wall heaters, 476,400.

ONE ORDER
•
ONE SOURCE
•
every
fastener need



Clean, Strong, Unified Threads from lot to lot!

Assure interchangeability with bolts and nuts that fit as they should—uniform from fastener to fastener, order to order.

Our quality controlled bolts and nuts meet exacting tolerances for proper fits and strong connections. Smooth-turning threads assemble easily yet snugly, and give maximum holding power.

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Sold through leading distributors.

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SCREW AND BOLT CORPORATION OF AMERICA
P.O. Box 1708
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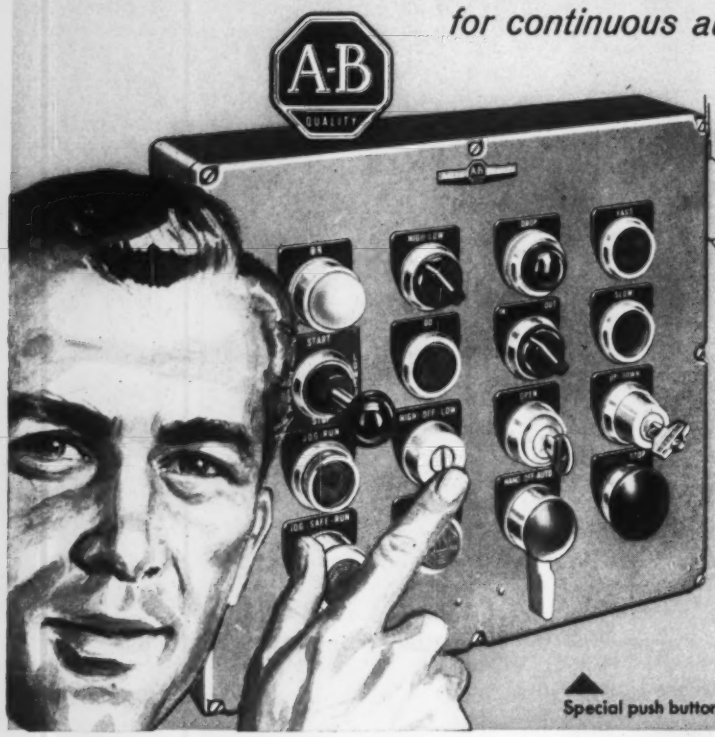
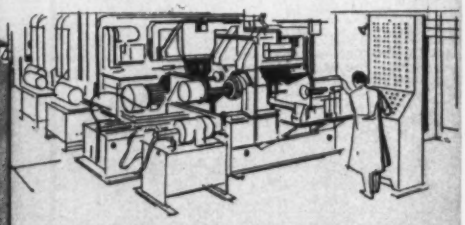
SERVES THE NATION
Formerly Pittsburgh Screw and Bolt Corporation

America's Most Complete Line of Industrial Fasteners

AUTOMATION BEGINS HERE

. . . Insist on Allen-Bradley accessories for continuous automatic production

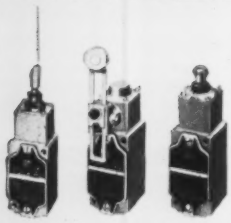




In this broad line of Allen-Bradley accessories, each and every unit carries the traditional A-B trademark of *quality* that stands for trouble free operation. Rugged construction, and maintenance free, silver alloy contacts provide the reliability that is essential to the continuous operation of *your* automatic production machines.

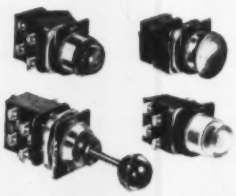
Profit from the experience of the leading machine tool builders . . . insist on Allen-Bradley *quality* motor control *all the way!*

Special push button panels can be assembled to your specifications.

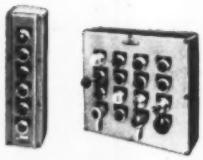


OILTIGHT LIMIT SWITCH
Bulletin 802T with sealed heads and bodies. Various operators.

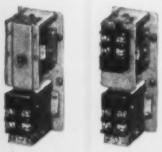
PRECISION LIMIT SWITCH
Bulletin 802 oiltight. Responds to very small operator travel.



OILTIGHT CONTROL UNITS
Bulletin 800T. Choice of push buttons, lights, and switches.

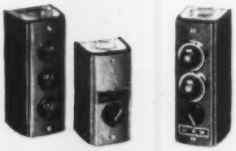


OILTIGHT CONTROL STATIONS
Bulletin 800T for up to 16 units in die cast aluminum enclosure.

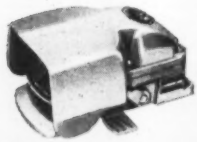


PNEUMATIC TIMERS
Bulletin 849. Reliable and accurate. For on-delay or off-delay.

OILTIGHT PRESSURE CONTROL
Bulletin 836. For hydraulic systems with pressures to 5000 psi.



STANDARD DUTY PUSH BUTTONS
Bulletin 800. Up to three units, also pilot lights and switches.

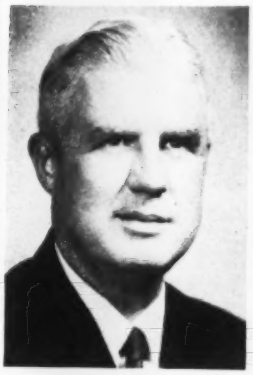


FOOT SWITCH
Bulletin 805. In rugged die cast housing for toughest service.

ALLEN-BRADLEY
Member of NEMA

QUALITY MOTOR CONTROL

Allen-Bradley Co., 1320 S. Second St., Milwaukee 4, Wis. In Canada: Allen-Bradley Canada Ltd., Galt, Ont.



J. MARSHALL SMITH
Sylvania plant mgr.

F. J. STUART
National Screw prod. mgr.

RAYMOND R. STUCKEY
L. W. Nash v. p.

WILLIAM ROORDA
Clearing production eng.

J. Marshall Smith was appointed manager of the metal base plant of **Sylvania Electric Products Inc.**, Warren, Pa., subsidiary of General Telephone & Electronics Corp. He was manufacturing superintendent at Sylvania's fluorescent plant at Danvers, Mass. He replaces **R. H. Alexander**, named engineering manager for the division's metal base operations.

F. J. Stuart was appointed production manager of **National Screw & Mfg. Co.**, Cleveland, to succeed **Clayton Cross** who left the company. Mr. Stuart has been with National Screw for 20 years in various production departments.

Harvey N. Barrett Jr. was placed in charge of a new department for markets development at **Basic Inc.**, Cleveland. He has been a vice president of the company since 1953. **Warner B. Bishop** joins Basic as vice president-sales. He was a vice president of Archer-Daniels-Midland Co. and president of two A-D-M subsidiaries.

Robert Martin was promoted to vice president - general manager, **Ling-Altec Electronics Inc.**, Culver City, Calif. **James Ross** was made vice president-research and development; **Paul Goodwin** chief engineer in charge of Ling commercial and military product lines.

Pratt & Letchworth Div., Buffalo, Dayton Malleable Iron Co. Inc., appointed **James F. Gaff** chief metallurgist; **William F. McQuillin** foundry engineer to supervise installation of new machinery.

Raymond R. Stuckey was elected a vice president of **L. W. Nash Co.**, East Palestine, Ohio. He retired recently as secretary and general superintendent of Alliance Machine Co.

Roy B. Williams was made west coast plant manager, **American Machine Div.**, United States Chemical Milling Corp., Culver City, Calif.

Dr. Raymond E. Robinson was elected president, **International Epoxy Corp.**, Ft. Lauderdale, Fla. He was executive vice president.

F. Swift Gibson was made purchasing agent, Industrial Apparatus Div., **Raytheon Co.**, Waltham, Mass.

Charles E. Schab was named general manager of the Kellogg, Idaho, operations of **Bunker Hill Co.**, effective Jan. 1, 1960. He will succeed **Wallace G. Woolf**, who retires that date. Mr. Schab is presently assistant to the president. As chairman of the lead-zinc mining industry's Emergency Lead-Zinc Committee, he has been active most of the last two years in Washington.

William F. Hubbell, former manager of warehouse sales, **Flint Steel Corp.**, Tulsa, Okla., was appointed assistant director of purchases.

Alfred Cutler, for eight years European manager of Hewitt-Robins Inc., was appointed manager of international operations for **H. K. Porter Company Inc.** He has headquarters in New York.

William Roorda was made director of production engineering, **Clearing Div.**, Chicago, U. S. Industries Inc.

C. J. Steinke was appointed works manager, **Cutler-Hammer Inc.**, Milwaukee. He succeeds **E. S. Mathiesen**, recently made vice president-manufacturing. Mr. Steinke was manager of operations production.

V. M. Holloway was made general sales manager, Construction Machinery Div., **Allis-Chalmers Mfg. Co.**, Milwaukee. **J. M. Haile** was made assistant general sales manager, **K. A. New** manager of dealer development, **L. D. Myers** eastern region sales manager, **L. D. Craggs** branch manager at Memphis, Tenn.

John M. MacCrum was named vice president-sales, **American Forge & Mfg. Co.**, McKees Rocks, Pa.

Richard Lindgren was made manager of motor sales for **Emerson Electric Mfg. Co.**, St. Louis, and its subsidiary, Emerson-Western Co., Colorado Springs, Colo. He succeeds **O. D. Metz**, now assistant to the general sales manager.

John W. Hutchinson Jr. was made motive power market supervisor of **Exide Industrial Div.**, Electric Storage Battery Co., Philadelphia. He succeeds **Thomas R. Lane**, made manager of advertising and sales promotion.

O. T. Thompson was made Detroit district manager, **Carpenter Steel Co.**, to succeed **C. O. Ericke**, retired. **H. H. Moeller** replaces

GEORGE W. BROWN
Wagner Electric president

PAUL J. SELINGER
Standard Tube prod. dev.

ROBERT N. HARWOOD
J&L Cleveland warehouse mgr.

HOWARD G. RISTOW
Bennett-Ireland prod. supt.

Mr. Thompson as branch manager at Detroit.

George W. Brown, former executive vice president, was elected president and chief executive officer of **Wagner Electric Corp.**, St. Louis, and president of its subsidiary, Wagner Brake Co. Ltd., Toronto, Ont. He succeeds the late **J. H. Devor.**

James T. Smiley was made assistant manager-tubular products, **Jones & Laughlin Steel Corp.**, Pittsburgh. He has responsibility for the merchant pipe area, Tubular Products Div.

J. K. Parks was made general manager of the new Detinning Div. of **Metal & Thermit Corp.**, New York. His responsibilities include procurement and sales as well as operation of M&T detinning plants at Carteret, N. J., East Chicago, Ind., and South San Francisco, Calif. He was director of purchases and traffic.

Paul J. Selinger was appointed manager of product development for **Standard Tube Co.**, Detroit. He continues as manager of stainless sales.

Robert N. Harwood was named manager, Cleveland Steel Service Center, **Jones & Laughlin Steel Corp.'s** Warehouse Div. **N. E. Willkomm**, who has been manager of the Cleveland warehouse, will share administrative duties with Mr. Harwood as assistant manager. Mr. Harwood was vice president of Solar Steel Corp.

Louis M. Ballard was appointed president of **Micro-Path Inc.**, subsidiary of Topp Industries Inc., Los Angeles. He was vice president and general manager of Vinnell Steel Co.

Dr. Finn J. Larsen was named to the new post of vice president-research for **Minneapolis-Honeywell Regulator Co.**, Minneapolis. He has been director of research since 1953.

Howard G. Ristow fills the new post of production superintendent, **Bennett-Ireland Inc.**, Norwich, N. Y. He has served the company as a consultant.

Norman I. Botwinik was elected president, **Botwinik Bros. Inc.**, New Haven, Conn., to succeed the late **Louis Botwinik.** In addition, he was also elected president of Botwinik Bros. of Massachusetts Inc., Worcester, Mass., an affiliated company.

Lambert M. Kaspers was named to the new post of plant manager and assistant to the general manager of the Port Chester, N. Y., plant of **Russell, Burdsall & Ward Bolt & Nut Co.** He was plant manager at the Rock Falls, Ill., plant and is succeeded by **George J. Nieman** who headed the cost, payroll, and industrial engineering departments there since 1952. **Ronald M. Bowman** was named assistant manager at Rock Falls, a new post.

Lawrence J. O'Connor Jr. joined

J. K. PARKS
Metal & Thermit div. post

LOUIS M. BALLARD
Micro-Path president

DR. FINN J. LARSEN
Honeywell v. p.-research

LAMBERT M. KASPERS
RB&W plant manager

NOW A NEW STANDARD OF QUALITY FOR ROLLING FOIL AND STAINLESS

MIDVAC

Micro Lustre

FINISHING ROLLS

FINER FINISHES...
LESS GRINDING...
LONGER LIFE

Now, Midvale-Heppenstall offers the finest precision ground rolls made from consumable electrode, vacuum arc melted Midvac Steels with upper uniformity of fine grain structure, maximum freedom of defects and non-metallic inclusions. The results are rolls with a Micro-Lustre finish that assures rolling free of surface imperfections . . . can be ground as much as 50% quicker . . . give longer trouble-free service between grinds.

That is why Midvac Rolls are being used throughout the nation for rolling stainless steel, aluminum, foil, brass and precious metals. Midvac Micro-Lustre Rolls improve the finish of your products and save grinding time. Midvale-Heppenstall also makes forged rolls of any size, for any purpose required in the rolling of steel, aluminum, copper, brass, and other metals . . . as well as paper, plastics and rubber.

MidVac Rolls

MIDVALE-HEPPENSTALL CO., NICETOWN, PHILADELPHIA 40, PA.

Subsidiary of HEPPENSTALL COMPANY, Pittsburgh, Pa.

MH

WILLIAM R. MOGG
Crucible-Spring Div. gen. mgr.

DR. CLIFFORD E. BERRY
Consolidated Electro post

RALPH S. POISTER
Salem-Brosius v. p.

JOHN P. SIKORSKI
Precise Castings president

FREDERICK H. HUNTOON
Bendix Filter factory mgr.

BYRON K. HARTMAN
Syntron exec. v. p.-gen. mgr.

Cleveland Cap Screw Co., Cleveland, as southeastern sales manager.

John P. Sikorski was made president of the newly formed **Precise Castings Inc.**, Lafayette, Ind. He was vice president and general manager of S. U. S. Die Casting Co. Manufacturing vice president of the new corporation is **Ted Pickering** who formerly served Doehler-Jarvis Div., National Lead Co., as vice president and general manager, Batavia, N. Y., plant; and Precision Castings Co. as general manager, Chicago plant.

Thomas P. Sawyer was appointed sales manager, **Armstrong Bros. Tool Co.**, Chicago, succeeding the late **Henry B. Austin.**

John J. Hayes was named New York sales manager, **L. J. Wing Mfg. Co.**, Linden, N. J.

Robert E. Kramer was made assistant sales manager, Tool Div., **Vlchek Tool Co.**, Cleveland.

Frederick H. Huntoon was made factory manager, **Bendix Filter Div.**, Bendix Aviation Corp., Madison Heights, Mich. He was plant manager at Brockway Motor Trucks.

Byron K. Hartman was appointed executive vice president and general manager, **Syntron Co.**, Homer City, Pa., subsidiary of Link-Belt Co. He is succeeded by **Robert G. Bottorf** as sales manager of Link-Belt's Colmar, Pa., plant outside Philadelphia.

John W. Bunch was made works manager at **Hooker Chemical Corp.'s** Dallas plant, Phosphorus Div. He succeeds **H. William Kopp Jr.**, transferred to the division's Columbia, Tenn., plant as works manager. **Donald H. Kattman** was named manager of purchases of the Phosphorus Div., effective Sept. 1, when he moves to division headquarters in Jeffersonville, Ind. He has been assistant purchasing agent for the Niagara Falls, N. Y., plant and the Durez Plastics Div.

William R. Mogg was appointed general manager, Spring Div., **Crucible Steel Co. of America**, Pittsburgh. He succeeds **T. T. Crowley**, named vice president and general manager of Crucible Steel of Canada Ltd. Mr. Mogg joined Crucible last year as sales manager, Spring Div. He previously was sales manager-special products at Cleveland Graphite Bronze Co., a division of Clevite Corp.

Dr. Clifford E. Berry, former assistant director of research at **Consolidated Electrodynamics Corp.**, Pasadena, Calif., was made director of engineering for its Analytical & Control Instrument Div.

Ralph S. Poister was elected vice president-research and development, **Salem-Brosius Inc.**, Pittsburgh. He joined Crucible Steel Co. of America as operating vice president in 1947 and was retired by that company as senior vice president in April, 1958.

James McSharry joined the research and development group of **Mallory-Sharon Metals Corp.**, Niles, Ohio, as staff assistant for work in extractive metallurgy.

Floyd R. Brown, former vice president and director of casting sales, **Unitcast Corp.**, Toledo, Ohio, was promoted to vice president and director of marketing.

James M. Bell was named to the new post of assistant vice president-sales in charge of the Western Div. of **Russell, Burdsall & Ward Bolt & Nut Co.** He is in Los Angeles.

Robert F. Fox was made national sales manager, **Eutectic Welding Alloys Corp.**, Flushing, N. Y.

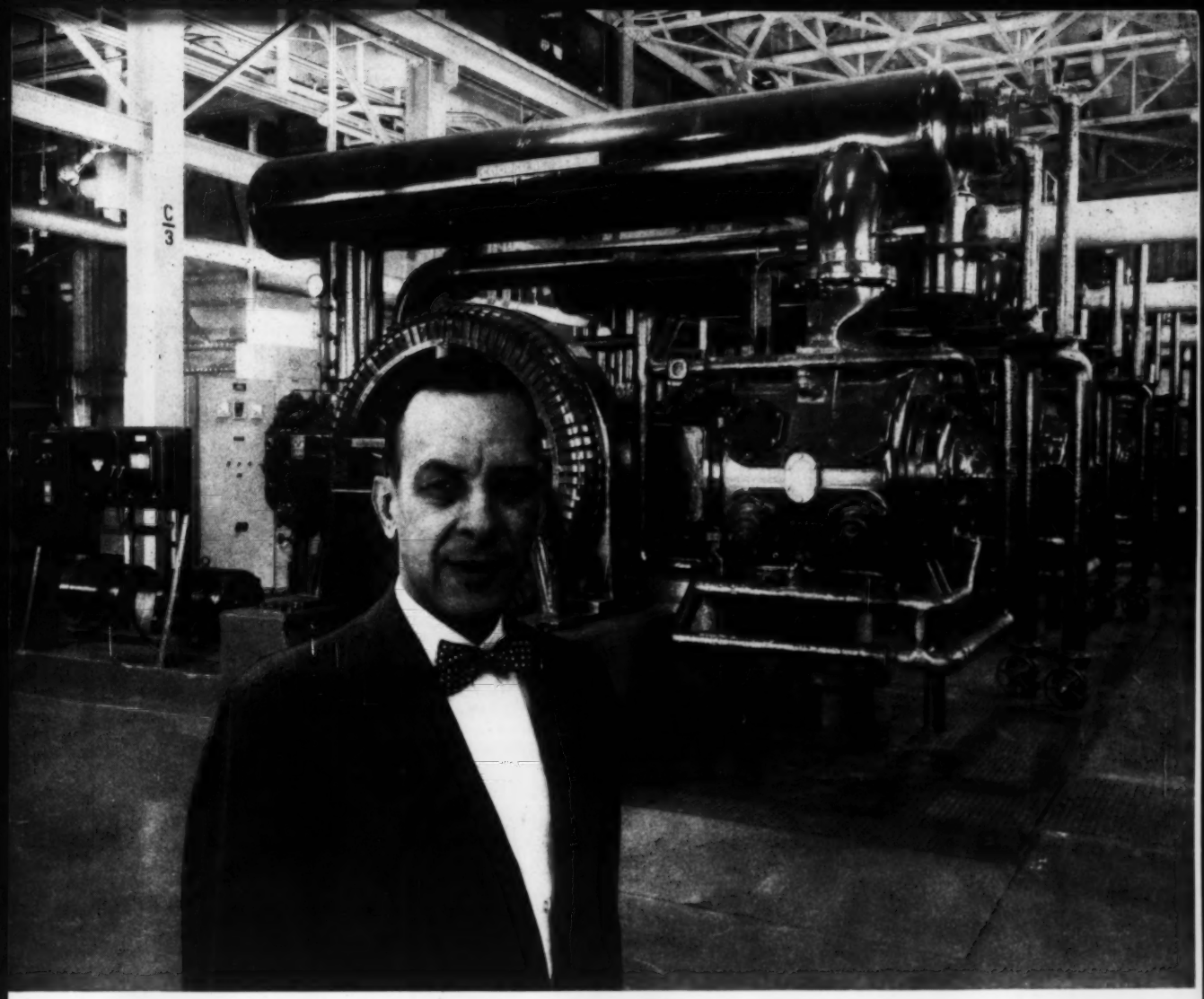
OBITUARIES . . .

Russell T. Todd, 69, consulting engineer, **McKay Machine Co.**, Youngstown, died Aug. 6.

William W. Ege, 59, vice president, **Copperweld Steel Co.**, Pittsburgh, died Aug. 8.

Albert F. Wall, 68, chairman, **Wall Colmonoy Corp.**, Detroit, died Aug. 3.

Ernest R. Hanson, 62, president, **Stanley-Humason Inc.**, Forestville, Conn., subsidiary of Stanley Works, died Aug. 13.



Grover H. Detmer, *Project Engineer,*
The Cooper-Bessemer Corporation, explains...

How Cooper-Bessemer compressors supply air for Ford assembly

Compressed air plays an important part in the production operations of the new Ford assembly plant in Lorain, Ohio. Behind this supply, you'll find four 400 hp Cooper-Bessemer compressors with En-Tronic controls. Housed in the power plant building, these units discharge at 104 lbs. pressure. Mains of 8" size carry the air about 1000 feet to the far ends of the huge plant. Pressure there is 98 lbs. The 5-step capacity controls automatically load the compressors to meet plant demands for air.

The Cooper-Bessemer equipment has been in use constantly since the plant was completed a year ago and have given excellent service.

Cooper-Bessemer M-line compressors for industrial air supply are available in sizes from 200 to 10,000 hp. Write for free copy of Bulletin M-81, "Air for Industry."

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Calgary • Toronto • Halifax
C-B Southern, Inc. . . . Houston
Cooper-Bessemer International Corporation . . . New York • Caracas
Mexico City
Cooper-Bessemer, S.A. . . . Chur, Switzerland • The Hague, Netherlands

Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS - DIESEL - GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINE OR MOTOR DRIVEN

Sylvania to Produce More Refractories, Transistors

SYLVANIA Electric Products Inc. is expanding facilities for production of refractory metals and transistors.

The growing needs of the nation's missile and space programs have created an increased demand for molybdenum and tungsten ingots of unusually large size and weight. Those metals and their alloys have the ability to resist extremely high temperatures such as those encountered by rockets, jet engines, and solid fuel motors.

• **Refractory Metals** — A 16 ton isostatic press has been installed at the Towanda, Pa., plant of the Chemical & Metallurgical Div. to produce ingots up to 4 ft long and 10 in. in diameter. Production of 275 lb molybdenum ingots, 4 ft long and 4½ in. in diameter, has begun. Until recently, commercially available tungsten and molybdenum ingots have weighed less than 100 lb.

A large, high temperature sintering furnace is being installed, "permitting the production of ingots weighing more than a ton," says G. L. Moran, vice president and divisional general manager.

Although use of large ingots of refractory metals is centered chiefly in military applications, the high temperature metals have important commercial uses in electronic tube parts, lamp filaments, carbides, welding electrodes, metallizing coils, flame spray coatings, electrical contacts, furnace windings, and furnace boats. They also have substantial potential applications in such devices as gas turbine engines, forging dies, piercing points for the manufacture of seamless tubing, and corrosion resistant equipment.

• **Transistors**—In another expansion move, Sylvania, a subsidiary of General Telephone & Electronics Corp., New York, has purchased a 25,000 sq ft plant at Manchester, N. H., for the manufacture of transistors. New production machinery and testing equipment designed and built at the division's headquarters at Woburn, Mass., will be installed. Manufacturing operations are scheduled to begin early in 1960, says Dr. W. J. Pietenpol, vice president and general manager of the Semiconductor Div.

Transistor sales will increase five times in five years, Dr. Pietenpol believes. He points out that industry-wide transistor sales this year are expected to total more than 91 million units with a volume of more than $231 million. That would compare with 1.3 million units valued at $5 million only five years ago. He predicts annual sales will increase to about 409 million units with a volume of $396 million by 1964.

Changes Rockbestos Status

Cerro de Pasco Corp., New York, has liquidated its subsidiary, Rockbestos Products Corp., New Haven, Conn., and will operate the business as a division, Rockbestos Wire & Cable Co.

Liskey Aluminum Expands

Liskey Aluminum Co. Inc., Elkridge Landing Road, Anne Arundel County, Maryland, is erecting a 6200 sq ft addition to its plant. The firm makes elevated aluminum flooring.

Forms Wisconsin Company

Lewis Steel & Aluminum Co. has been organized and is assuming the Wisconsin production operations of Korhumel Steel & Aluminum Corp. Officers of the firm, which has acquired the physical facilities at 4600 W. Mitchell St., West Milwaukee, Wis., are: President and treasurer, W. H. Lewis; vice president, Nick Cox; secretary, Mrs. W. H. Lewis.

The firm expects to expand its hot rolled steel business, particularly structural steel and plates. It is also an important factor in the cold rolled strip business and in the handling of cut length and coiled steel products. Slitting, shearing, and flame cutting are primary fabricating services. The firm is the Kaiser aluminum distributor in Wisconsin.

Sparton Forms New Division

Sparton Corp., Jackson, Mich., has created a Railway Equipment Div. to keep pace with its expanding activity in the railway industry. Headquarters will be at 17333 Healy Ave., Detroit, Mich., where the corporation's Allied Steel & Conveyor Div. also is situated. W. E. McKittrick is vice president of Sparton and general manager of the new division.

Press Brake Firm Expands

Dreis & Krump Mfg. Co., Chicago, has placed its plant addition in operation. The 15,000 sq ft building is equipped with two new horizontal boring machines and two-wide table, high-speed planers. It will be used for machining and assembly of the larger mechanical press brakes and a new line of hydraulic press brakes.

Inco Project on Schedule

International Nickel's mining project at Thompson, Man. (STEEL, Oct. 28, 1957, p. 124), is scheduled to start operations next year and come into full scale production at an annual rate of 37,500 tons of nickel in 1961. Capital investment in the project, exclusive of exploration and preproduction expenses, is expected to approximate $115 million.

The Manitoba project has proceeded in broad terms as follows: Thousands of tons of equipment were hauled to the mining area by tractor-train during the 1957 winter freeze; a railway spur connected Thompson with the Canadian National Railway's Hudson Bay Line in October, 1957; the 500 ft smelter chimney and the 261 ft mine headframe were completed in 1958; and the production shaft has been sunk to a depth of 2100 ft. In March of this year, the company announced plans for construction at Thompson of a nickel refinery which will get its power from Manitoba Hydro-Electric Board's plant being built 35 miles to the northeast.

Tatnall Leases More Space

Tatnall Measuring Systems, manufacturer of testing machinery, has leased 12,000 sq ft of space in an industrial building at Fourth and Spring Streets, Royersford, Pa., supplementing its present operations in Phoenixville, Pa.

Morris Machine Builds

Morris Machine Works, Baldwinsville, N. Y., plans to erect a $500,000 plant on its present site. The building will provide 60,000 sq ft of floor space for production and offices.

Gets Brazilian Contract

Ellicott Machine Corp., Baltimore, manufacturer of dredges and dredge equipment, has been awarded a $5.5 million contract by the Brazilian Ministry of Transport & Public Works.

Adds Casting Facility

Electronics Div., Gorham Mfg. Co., Providence, R. I., has added an investment casting facility as part of an expansion program. The new equipment will enable the division to produce its own complex castings for microwave antennas and components in aluminum, magnesium, and copper alloys. Edgar I. Gotthold has been named foundry superintendent of the division.

Signode Plans Addition

Signode Steel Strapping Co., Chicago, awarded contracts for the erection of a 6000 sq ft prefabricated metal storage building adjoining its plant in Baltimore County, Maryland.

Lewin-Mathes Modernizes

Lewin-Mathes Co., a division of Cerro de Pasco Corp., New York, is modernizing its copper and brass tube mill at Monsanto, Ill. Goal of the program is to effect operating economies which may run as high as 20 to 25 per cent of current production costs. Economies will result in the main from a substantial reduction in material handling and from innovations in operating procedures designed to afford progressively higher standards of quality control. Improved processing techniques will permit Lewin-Mathes to expand its product line in thin wall and other types of industrial tube not now being produced.

Work was begun early this year on another expansion program. It was designed to enlarge the capacity of Lewin-Mathes' electrolytic copper refinery from 48 million to 80 million lb a year.

Neenah Foundry Expands

Neenah Foundry Co., Neenah, Wis., is building a foundry that will double the company's casting capacity. The 48,000 sq ft facility will have a capacity of 250 tons of castings a day. It will have fully automated molding equipment, 85 in. cupolas, an 80 ft yard crane, and 1100 ft of railroad siding. No changes in the operation of the firm's plant No. 1 will be made. The firm specializes in gray and ductile iron castings.

NEW PLANTS

Kester Solder Co., Chicago, will start production of solder and fluxes in its factory at 913 Orangethorpe Park, Anaheim, Calif., Sept. 15.

Kelco Metal Products Co., Boston, established an aluminum service center in Worcester, Mass. The company is a distributor of nonferrous metals, including Olin aluminum, an operation of the Metals Div., Olin Mathieson Chemical Corp., New York.

Airline Welding & Engineering, Hawthorne, Calif., is constructing a plant at 15909 S. San Pedro St., Gardena, Calif. The company will move into the facility about Oct. 1.

J. D. Tool & Machine Co., Philadelphia, is constructing a plant on Tomlinson Road, Bethayres, Pa., which will double the firm's floor space. The company makes components and valves and does production machining. Operation of the plant is scheduled for late this month.

Hoeganaes Sponge Iron Corp., Riverton, N. J., established warehouse facilities in Vernon, Calif., under the name of Los Angeles Transportation & Warehouse Co. The firm makes sponge iron and special alloy powders for the powder metallurgy industry.

Monsanto Chemical Co., St. Louis, is constructing a plant to manufacture ultrapure silicon metal. Operations are expected to start before the yearend.

ASSOCIATIONS

Robert Joseph, president of Commercial Steel & Chemical Corp., New York, has been nominated by the **Institute of Scrap Iron & Steel Inc.**, Washington, to be a vice president of the Iron & Steel Scrap Section, Bureau of International de la Recuperation. The bureau is an international organization representing the waste material industries. Commercial Steel is in the brokerage, import, and export business.

C. G. Gehringer, Fairbanks, Morse & Co., Chicago, was elected president of the **Scale Manufacturers Association Inc.**, Washington. Other officers include G. L. McKenna, Toledo Scale Corp., Toledo, Ohio, vice president, and Arthur Sanders, secretary.

NEW OFFICES

Vanadium-Alloys Steel Co., Latrobe, Pa., opened a sales office at 227 W. Third St., Charlotte, N. C. Edward J. Dalgleish, southeastern district sales representative, is in charge of the new facility.

The management consulting firm, **M. W. Isaacson Co.**, Montvale, N. J., opened a branch office at 79 Wall St., New York 5, N. Y. The firm specializes in marketing, product development, and corporate expansion for the metalworking and metal producing industries.

Bee Chemical Co., Chicago, established east coast sales headquarters at 119 Ann St., Hartford 3, Conn. L. A. Dickinson is manager of the eastern sales operation.

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FOR SMOOTHER SKIN—Latest report is that a new nylon-abrasive product (Scotch-Brite) used by North American Aviation Inc., Los Angeles, to finish titanium alloy sheets markedly improves fatigue resistance—fewer, finer scratches eliminate stress raisers. Some steel firms also report they are finding that the material, made by Minnesota Mining & Mfg. Co., St. Paul, helps put a more uniform finish on decorative metals.

TRANSISTORS FOR HOT SPOTS — A new process to produce high purity, single crystals of silicon carbide promises to raise the operating ceiling for transistors (rectifiers too) from 400 to 1800° F. Stanford Research Institute, Menlo Park, Calif., grows them in an alloy melt by supersaturation.

ANOTHER STEP AHEAD—Tests on Solar Aircraft Co.'s latest gas turbine (rating: 1100 hp) indicate it may better the current fuel efficiency of 0.63 lb of fuel per horsepower. The San Diego, Calif., firm also claims it makes the smallest gas turbine for aircraft propulsion, a 70 hp version for a one man helicopter.

INTENSIFY WORK— The Bureau of Mines plans to give cesium, rhenium, and rubidium the "works" in 1960. Such metals hold great promise in the high temperature and nuclear metals fields.

SPUR USES FOR RADIOACTIVITY — More than $3 million is being spent to find more commercial uses for radioisotopes and high level radiation. More than 20 colleges, companies, and laboratories are participating in the Atomic Energy Commission's isotopes development program.

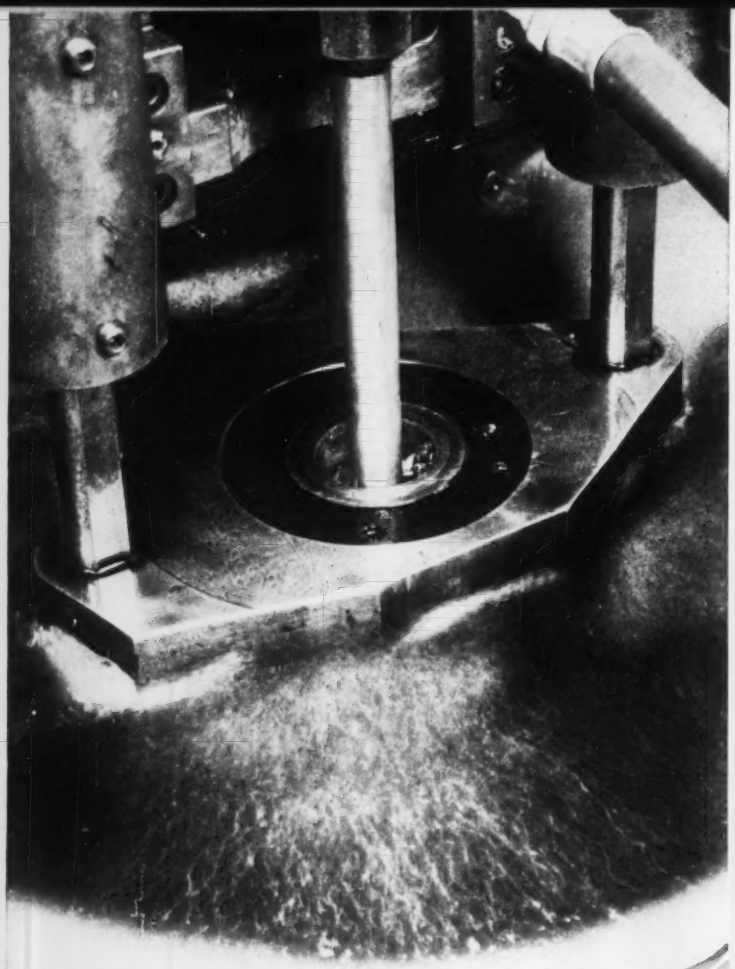
GEARS CLASSIFIED— Within six months, U. S. manufacturers will be able to use a new gear classification system, claims the American Gear Manufacturers Association, Washington. It will have 16 classes—Class 3 will be the crudest, while Class 14 corresponds to the finest now being made. Each class will have several variables—for example, you will be able to specify a Class 8 runout with a Class 9 tolerance on pitch.

TRAVELING FURNACE—Honeycomb for aircraft is brazed faster and better by a kind of envelope furnace open at both ends that fits around a component and moves along on tracks. It's cheaper than one big furnace yet handles parts too long to fit ordinary furnaces, states Solar Aircraft Co., San Diego, Calif.

REPORTS FOR NUCLEAR USERS — Those who own or employ radioactive materials may be required to make semiannual reports on receipts, transfers, and inventories if comments from the Atomic Energy Commission are taken seriously. If you're interested, send your views to: Director, Division of Licensing & Regulation, Atomic Energy Commission, Washington 25, D. C.

TURBINES TO BLOW STACKS— Steelmakers, intrigued with low capital investment and high efficiency, will use gas turbines to blow blast furnaces, says Industrial Gas Turbine Dept., Westinghouse Electric Corp., Lester, Pa. Low Btu, byproduct gas from the stacks will be used for fuel. The first installation will be at South Works, United States Steel Corp., Chicago.

PROGRESS NOTE— Free piston engines apparently won't be practical on automobiles, thinks Electromotive Div., General Motors Corp., La-Grange, Ill. Experiments in its Engineering Dept. so far have failed to show any significant advantages over standard diesel piston engines, especially since the advent of the turbosupercharger. Prediction: Success will be limited to the large versions.



Ex-Cell-O Corp.

What's Going On In Electromachining

Plenty, say the U. S. experts. Process refinements, plus more job experience, are creating new and important fields for both the spark and electrolytic methods

HORIZONS for both electrospark and electrolytic machining methods have been broadened. They began as toolroom innovations, have earned placement on the production line.

Spark machining, in which a shower of electrical sparks is used to blast off metal particles, is moving into the diesinking field. Electrolytic machining, in which the metal is electrolytically deplated from the work, is already proving itself on new, difficult to work steel alloys. Here is a progress report on some U. S. developments in both methods:

Spark Machining

Although the process is nearly 20 years old, spark machining (also called electrical discharge machining) is not found in many U. S. metalworking plants. The reason: It's been confined to special jobs—it's a whiz at cutting metals (like carbide) that can't be machined conventionally.

Process refinements, plus some new industry needs, have opened the door to new jobs. Today, it is much less specialized than it was even a year ago.

• **Die Challenge** — Take, for example, the field that many experts figure is the next big pie for spark machining to cut into—diesinking.

In most cases, says Robert Webb, director of research, Elox Corp. of Michigan, Troy, Mich., spark machining will augment conventional machining to reduce the time needed to produce finished dies and cut the die cost. The process is being used on forging-type cavity dies, and through-hole dies like those for blanking, punching, and stamping.

The rough cavity usually is machined with conventional techniques. Then, using a shaped electrode, the finish machining is done by the spark process. Tolerances on contours can be held to 0.005 in. or finer. Surface finish can be excellent.

Since the finish machining can be done after the die has been heat treated, distortion and growth are no problems. The largest single time saving comes in the elimination of the bench time.

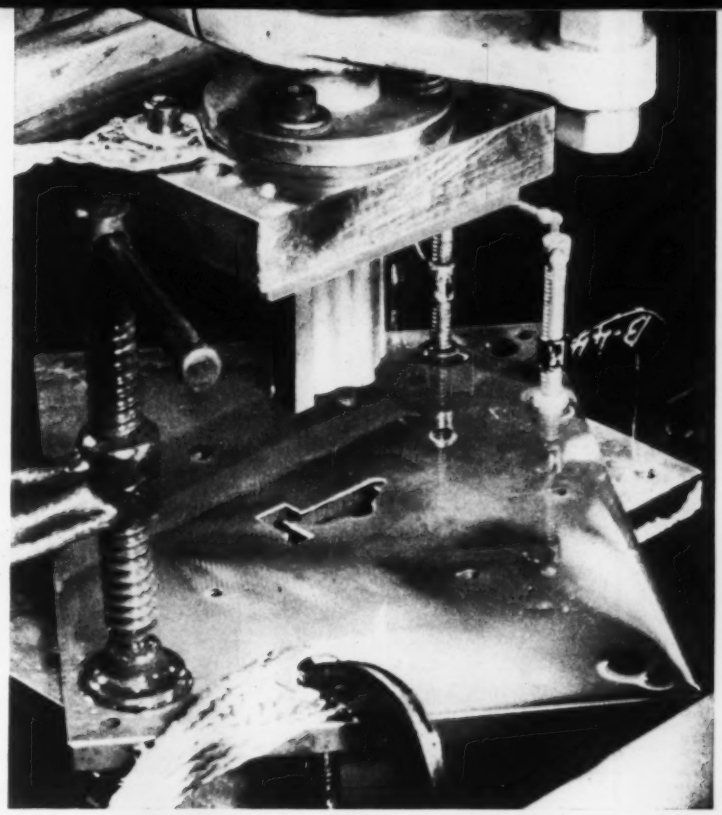
In some die applications, the male half is used to produce the

mating form. It's done two ways. First, on a forging type die, the machined male can be plated, metal sprayed, or covered with sheet metal that, when properly backed up, becomes the electrode.

In blanking dies, the punch can be used to form the hole. The punch is made longer than will be used in the press. This extended punch finishes the hole in the die (usually the hole is roughed out conventionally) to tolerances as close as ± 0.0005 in. After spark machining, the eroded end of the punch is cut off.

• **Shaped Holes**—A second field for spark machining growth, says Bill Kane, Elektrojet engineer, Cincinnati Milling Machine Co., Cincinnati, is in precise odd shaped holes, where conventional machines are limited.

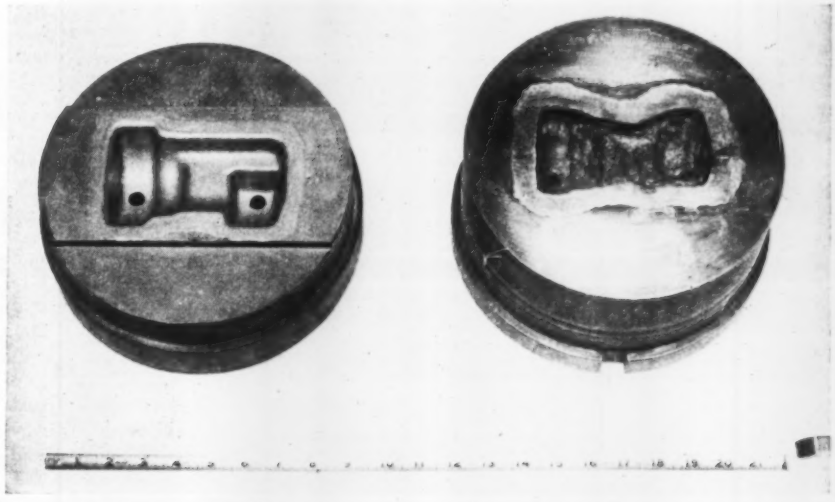
C. Paul Porterfield, vice president, Method X Div., Firth Sterling Inc., Pittsburgh, cites the example of having to attach an odd shaped tubing to a curved sheet surface. Normally, the layout and cutting job would be difficult. But with spark machining, a piece of the tubing can be cut off, dipped in acid to reduce its size, then used as an electrode to cut the hole in the sheet.



A machined punch finishes the mating hole in this blanking die. The hole was first rough machined conventionally, then the die was heat treated. The method assures perfect alignment between punch and die. After the Elox setup is completed, the eroded part of the punch is cut off; the remainder becomes the working punch. It used to take 21 hours to complete this punch and die set. Now it takes 10½ hours

• **Process Developments**—Electrode wear, the industry's toughest problem, has been reduced substantially. Part of the solution has come with the ability to fabricate electrodes out of the optimum material—carbide instead of brass for some jobs, for example. Electrode life also has been boosted with the advent of better dielectric fluids, and experience is showing combinations of electrode materials and fluids that give optimum life.

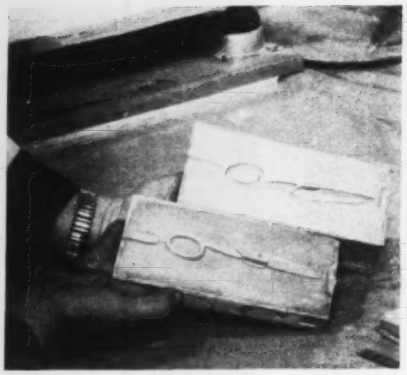
Elox technicians, for example, have disclosed "a combination of electrode, coolant, and workpiece that, for certain general classes of die steels, gives a wear ratio of 200 to 1, 200 parts of workpiece removed for one part of electrode



This forging die (left) illustrates a drive being made by spark machining experts. The machined cavity is first filled with Haynes Stellite alloy No. 6 (as at right) then finish machined by Elox. Die life is five times that of a plain steel die block. Requirements for skilled diesinking and bench finishing are eliminated

Metal Spray Forms Contoured Electrodes

By eliminating the need for a metal master, the process will help on one-of-a-kind dies. Also, it can help you use optimum electrode materials, such as carbides



A cast plaster negative shape (lighter part) is compared with the master that was used to mold the shape. Usually, one negative is cast for each electrode that will be used

Elox Corp. of Michigan.

Six plaster negatives are sprayed with a high property electrode material. After the sprayed layer reaches a thickness of 0.030 to 0.090 in. (depending on cavity depth), it is backed up by pouring a low melting alloy on top. As soon as this alloy hardens, the plaster is broken away, leaving exposed the sprayed electrode material

consumed in cutting."

Yet, the test showed, the electrode in standard coolant has a wear ratio of less than 5 to 1, and the coolant used with other electrodes has either no advantage or a disadvantage when compared with standard coolants.

Penetration rates of most spark machines have gone up. Laboratory trials have removed as much as 40 cubic inches an hour in steel.

Most U. S. proponents, however, are paying less attention to extreme removal rates than they are to satisfactory rates with good finishes and close tolerances. Ex-Cell-O Corp., Detroit, is bringing out a new machine on which the operator can select any of seven cutting levels. A test bar of hardened steel shows the range: From a rate of 0.0005 cu in. a minute and a 30 microinch finish, to 0.015 cu in. a minute and a 200 microinch finish.

Improved electrospark machine tools, with more accurate servo feeds, preclude the tool touching the work, and maintain the proper gap at all times. A host of power supply refinements has boosted the efficiency of the cutting.

Electrolytic Machining

Electrolytic machining may well be the country's fastest growing machining method. Lynn A. Williams, president, Anocut Engineering Co., Chicago, says his company's sales soared at least tenfold in the last five years. Dollar volume climbed about 30 per cent during the recent recession.

"The tool grinder market still is our biggest single market today," reckons Mr. Williams. "This market has not yet been more than scratched."

• **In Transition**—Advantages that apply to electrolytic tool grinding are carrying the process out of the toolroom to the production floor.

STEEL talked to an Anocut customer about a job he had to do. It consisted of taking about 0.060 in. stock off each of two pads on a jet engine part. The material was Rene 41, and each pad measured roughly 1 sq in. Already in production on the part, the customer was milling the stock, taking about 1 hour for each pad, and ½ hour for setup—2½ hours for the whole job. He couldn't mill faster because the flimsy part would distort and heat up. He couldn't grind, because of severe part heating, and because wheel life was nil.

In a test setup at Anocut, the customer saw the part completed in about 15 minutes—taking about 1 minute to complete the grinding of each pad, with 13 minutes going to locating and clamping.

• **Improvements**—A new electrolyte, tailored for steel, has boosted metal removal rates by more than 200 per cent.

New wheels for steel jobs are impregnated with aluminum oxide instead of the diamond used on carbide. The wheels are cheaper and last longer on steel. In a test, 28 linear inches of a hardened steel

bar were electrolytically ground into the side of a wheel. Measured before and after the test, the wheel showed only 0.0001 in. of wear.

Here are four general areas in which Mr. Williams sees a steel potential for electrolytic grinding:

1. Hard alloys. Hardness seems to make little or no difference to the process.

2. Tough alloys. Some high property materials wear out the cutters, take excessive power in machining. Electrolytic rates are the same for these metals as for conventional alloys.

3. Burr problems. Most stainless steels tend to throw burrs when they are machined, says Mr. Williams. The problem becomes critical in precision parts and parts like hypodermic needles, where burr removal is costly. Electrolytic machining produces no burrs.

4. Temperature sensitive metals. Machining generates heat. In some cases, the excessive temperatures created are detrimental to the workpiece. In those cases, electrolytic grinding may bring the answer.

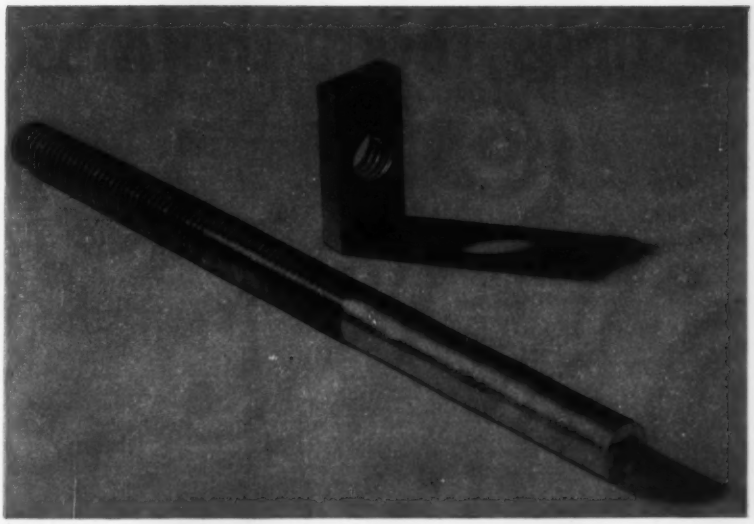
• **New Field**—Electrolytic machining has confined itself to grinding.

Says Mr. Williams, "We are close to perfecting a method of electrolytic hole sinking. We can sink irregularly shaped holes into a variety of steels and superalloys at 0.002 to 0.007 in. a second."

Accuracies of 0.001 to 0.005 in. are easily obtained; the surface finish can be excellent. Most significant, there is no heating on the part, and tools show no wear as the result of ordinary use.

This process, and the new ability to machine supermetals efficiently, have broadened the horizon of electrolytic machining.

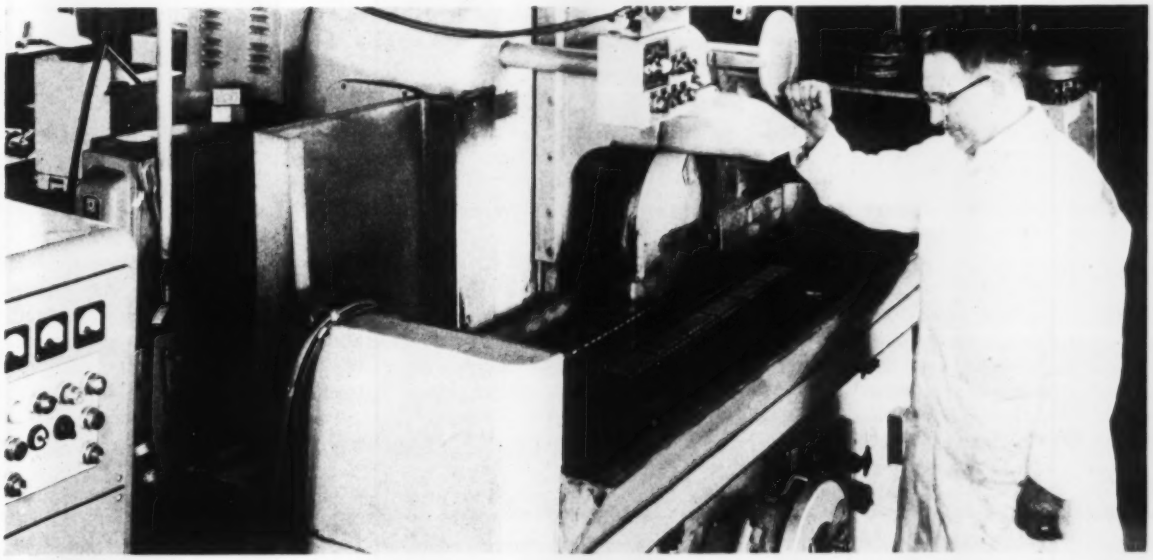
• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



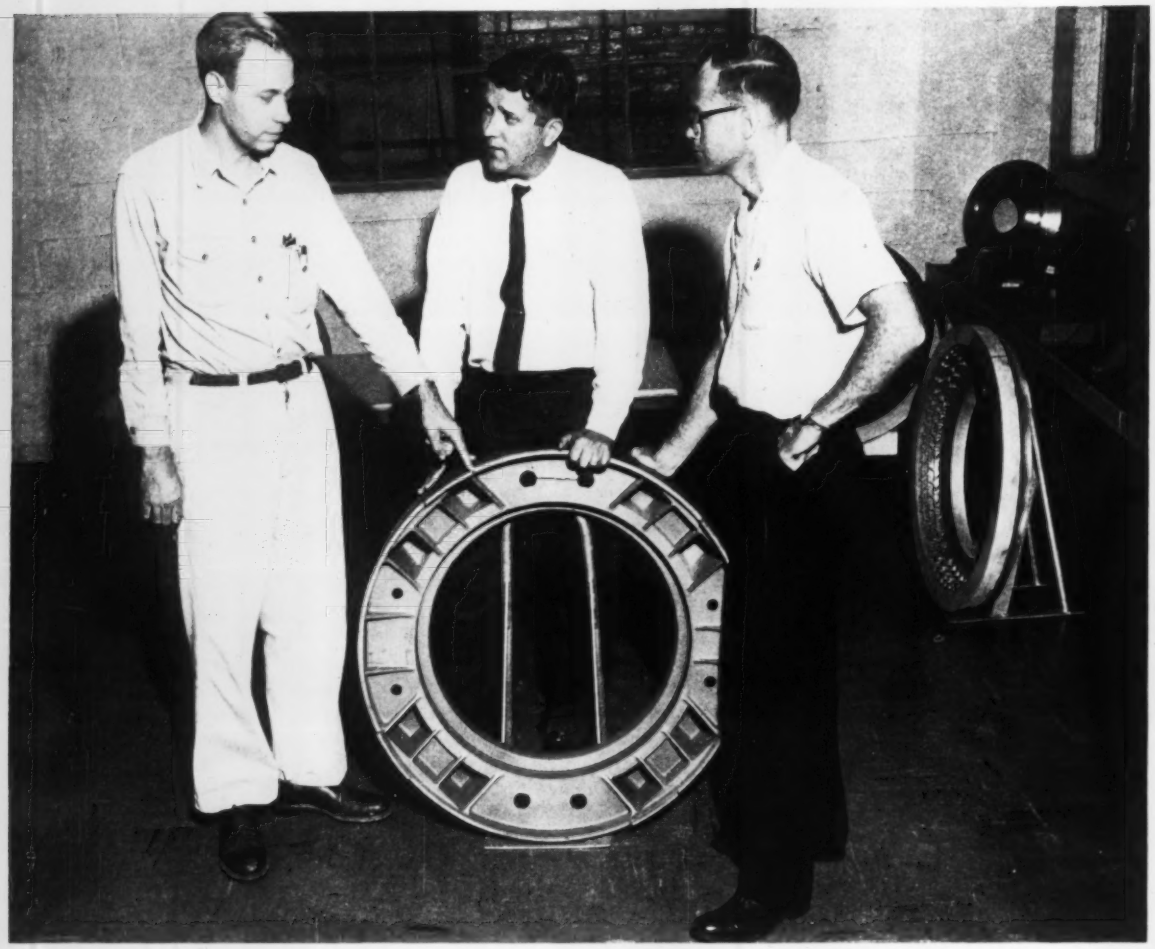
This spectacular type of work has become the bread and butter business of spark machining. This job, done at Ex-Cell-O Corp., Detroit, consisted of putting the ½-13 threaded hole in a carbide blank, sinking and threading the hole in a single pass. The tool is a threaded piece of off-the-shelf brass tubing. Total time for the job: 11 minutes

Machines like this Thompson surface grinder are helping electrolytic grinding evolve from a toolroom process for carbides to a full-fledged production operation on a host of problem metals. A machine like this trimmed production time on a Rene 41 jet engine part from 2½ hours to about 15 minutes

Anocut Engineering Co.



Castings Tackle the Muscle Jobs



The cast ring (a production part) is for a still-classified missile. The ring, made from modified 8740 steel, has minimum requirements of 260,000 psi ultimate tensile strength, 210,000 psi yield strength, and a 3 per cent elongation.

The three man team heads up the group responsible for the casting program. Left to right: J. E. Fries, process metallurgist, Francis B. Herlihy, director of metallurgical research, and Hugo R. Larson, research metallurgist

With tensile strengths as high as 300,000 psi, steel castings are moving into competition for aircraft and missile critical structural parts. Next step: High temperature properties

IN THE ROLLING farm country of northern New Jersey, a team of research and process metallurgists is quietly sparking a revolution in metal casting. Experiments have led to cast steel parts with tensile strengths as high as 300,000 psi, probably two to three times higher than most people realize is possible.

The revolution has put castings squarely in the race for critical jobs in top aircraft and missile projects. Already, many prime contractors are using the castings in production.

The men responsible for the process work at American Brake Shoe Co.'s Research Center, Mahwah, N. J.

• **The Goal** — Aircraft structural shapes have critical requirements of weight, strength, or dimensional tolerances. Francis B. Herlihy, American Brake Shoe's director of metallurgical research, says: "Many of these components have complicated shapes which are difficult or expensive to produce conventionally. For this reason, we foresee considerable savings in time and manpower in utilizing cast shapes in the medium and ultrahigh strength range."

Such parts became targets for a high strength castings project.

• **How It's Done** — Incorporating only one proprietary secret (the ceramic mix for the cope and drag

molds), the process takes advantage of refined casting technology plus the key ingredient—meticulous control over every stage from the loading of the melt furnace to the installation of the part.

The first stage of refinement comes in the raw material used for the melts. Electrolytic iron (at about 30 cents a pound), and sponge iron briquets (at about 15 cents a pound) are used instead of scrap (worth about 3 cents a pound). Hugo Larson, research metallurgist, points out: "You must keep in mind that we are considering castings in which the utmost in quality is required. The cost of the metal becomes lost in the savings we get by reducing scrap losses and weld repairing, and in achieving our extreme properties."

The hot metal, in an induction furnace, is poured carefully into

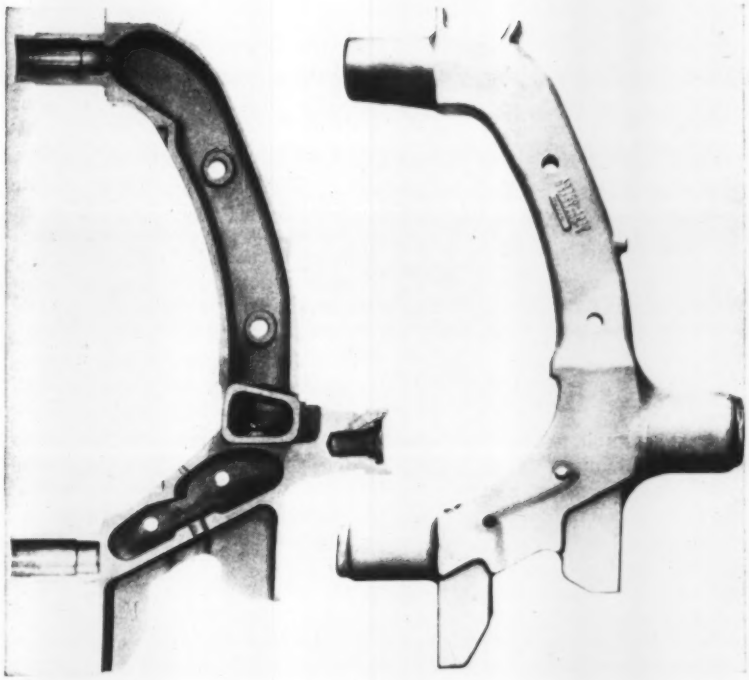
(*Please turn to Page* 86)

Typical Properties

Here are some of the metals cast at American Brake Shoe. The properties listed are those that can be reasonably expected after heat treatment. In some cases higher properties can be achieved

Alloy	Yield Strength (psi)	Tensile Strength (psi)	Elongation (%)
8740	230,000	285,000	4.5
4340	215,000	280,000	6.0
4330	200,000	250,000	9.0
H-11	205,000	260,000	9.5
17-4 PH	165,000	195,000	11.0

How Would You Make This Part?



THIS IS a critical aircraft component with two restricting requirements. It must have a tensile strength of at least 180,000 psi. It must be relatively light, since it's used to hold weapons or fuel tanks under airplane wings.

Conventionally, you might make this part from a semifinished shape, then arrive at final tolerances and weight specifications by machining. Or, you might fabricate the part from high-property steel components. In either case, studies at Grumman Aircraft Co., Bethpage, N. Y., showed that tooling and production costs would be excessive.

Grumman's answer: The parts are cast from 4330 steel by the American Brake Shoe Co. Cast to close tolerances, the parts require a minimum of machining at Grumman. Further, the cored construction has helped Grumman trim the part weight to a minimum. Most important, the castings live up to the 180,000 psi tensile requirement.

These parts are typical of the high strength castings being turned out in production quantities. Above, a launching gear is cast from 4330 steel in which the chrome content has been raised. The part tests at 150,000 psi ultimate tensile strength, 125,000 psi yield strength, and 10 per cent elongation. Below, a gear case, cast from 17-4 PH steel, has 180,000 psi tensile strength, 140,000 psi yield strength, and 6 per cent elongation

the molds. The risers are hot topped with an exothermic material. Ceramic molds permit the castings to cool without distortion and hot tearing. Acting as an insulator, the mold promotes even cooling of both light and heavy sections.

After being broken out of the molds, each part is inspected for cracks, distortion, or warp, and for dimensional tolerances. In addition, the metallurgists get tensile, yield, and hardness readings for each heat of metal poured.

• **Heat Treat**—Normal heat treating procedure followed by the specialists on the high strength parts includes homogenization, austenitizing, and tempering.

Homogenization is done at about 1850° F in an electric furnace. A nitrogen atmosphere prevents decarburization. That step is designed to prevent segregation of the metal ingredients that could cause hard or soft spots or local weak points.

Next comes an austenitizing treatment in which the part is heated to about 1575° F and is held there for roughly 90 minutes. That interval allows the carbon to thoroughly diffuse in an austenitic structure. Then, when quenched, the austenite transforms to martensite. It means the casting is uniformly hard, but it lacks toughness.

Toughness comes in the low-temperature tempering operation (about 410° F for 4 hours). Temperature is deliberately held down at this stage so the high tensile and yield strengths are not lost.

Temperatures and times of these operations vary slightly, depending on the alloy. Figures cited are for the 8740 steel cast missile ring. In most cases the heat treating is done at Mahwah.

If, as in the case of the ring, the casting will be welded to other components later, the heat treating is left for the customer to complete after welding.

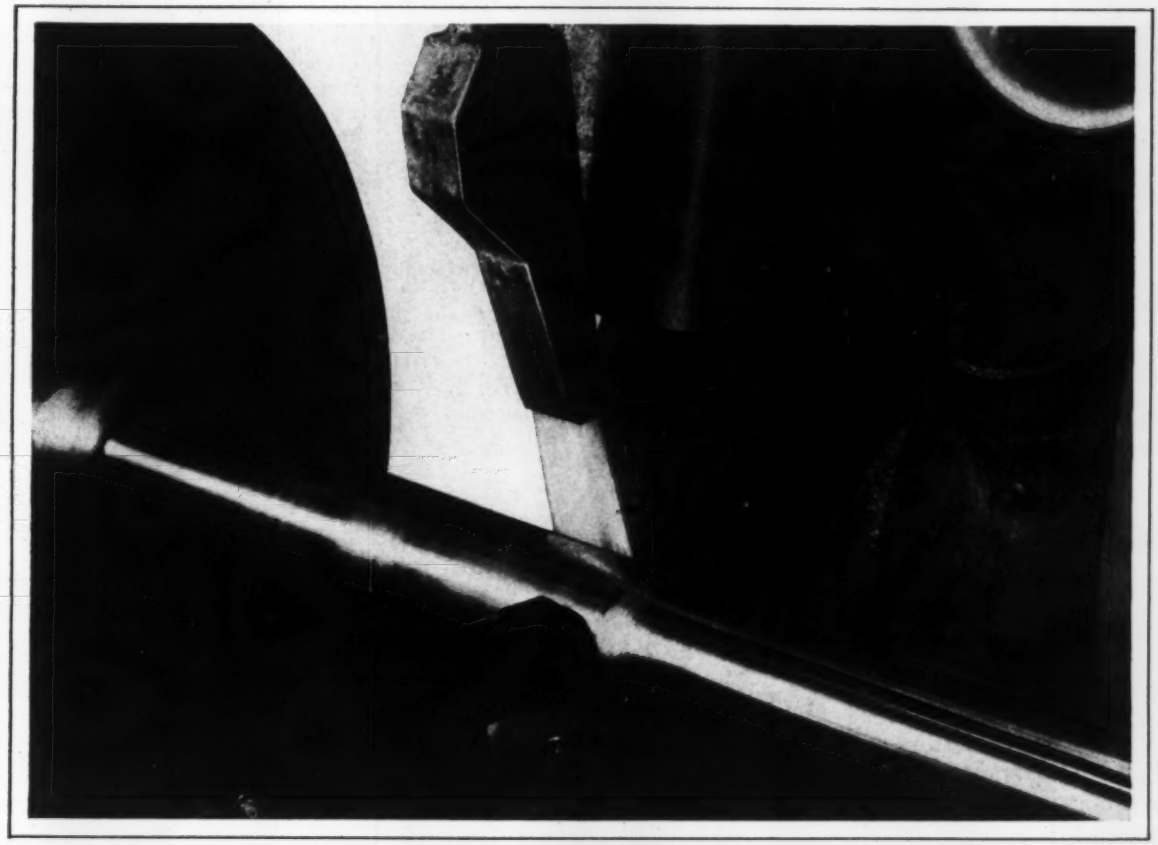
• **Now, Hot Jobs**—Most of the alloys worked with so far have been oil-hardening types, tempered in the 400 to 500° F range for highest strengths. The metallurgists are working with some air-hardening alloys that will temper at about 1000° F and still retain their strength.

The important aspect of this higher range is that it will permit the castings to operate at temperatures in excess of 600° F, a common requirement now for many aircraft parts.

The castings are admittedly costly. But in competition with extensive tooling and production times that would go with fabricated structures, and when compared with the machining costs that accumulate from starting with a less refined shape, American Brake Shoe specialists point out that the casting may well be the over-all cheapest way to make a wide variety of critical structural parts.

They are out to prove they are right.

US RUBBER GRINDING WHEELS



"U.S." Grinding Wheels installed on Naxos-Union roll grinder.

"We're standardizing on 'U.S.' GRINDING WHEELS"

—Mr. Alex Munroe, Revere Copper & Brass, Inc.

After Alex Munroe of Revere's Baltimore plant installed "U.S." Grinding Wheels on their Naxos-Union roll grinders (for reconditioning rolls on their Sendzimir 51" rolling mill) several things were immediately apparent. Chatter was eliminated and stock removal was clean and efficient. Grinding time was cut approximately 30% while producing a regular finish.

That's why Revere is standardizing on "U.S." Grinding Wheels, not only on roll grinders but for reconditioning large back-up rolls. In fact, wherever "U.S." Wheels are used, performance reports have been excellent.

If you, as a manufacturer, want to reduce grinding wheel costs and increase production, "U.S." has what it takes. For "U.S." Wheels consistently outperform and reduce costs in case after case. Get in touch with your "U.S." Representative today or write or call the address below.

US RUBBER Mechanical Goods Division

United States Rubber

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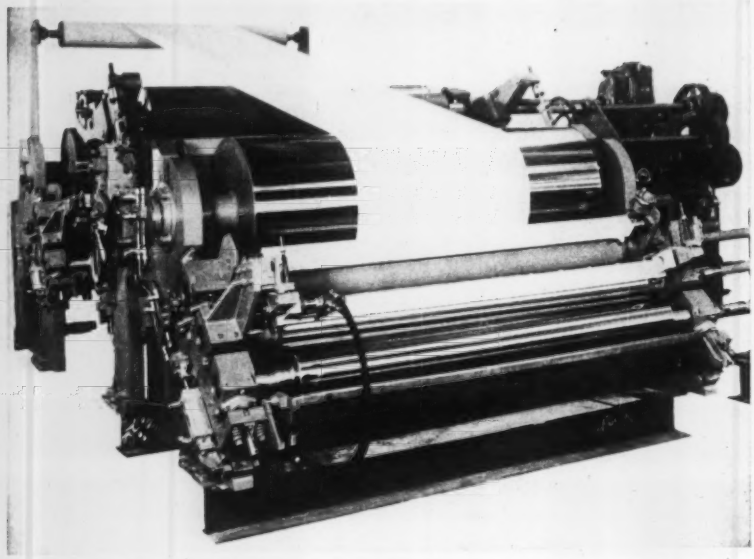
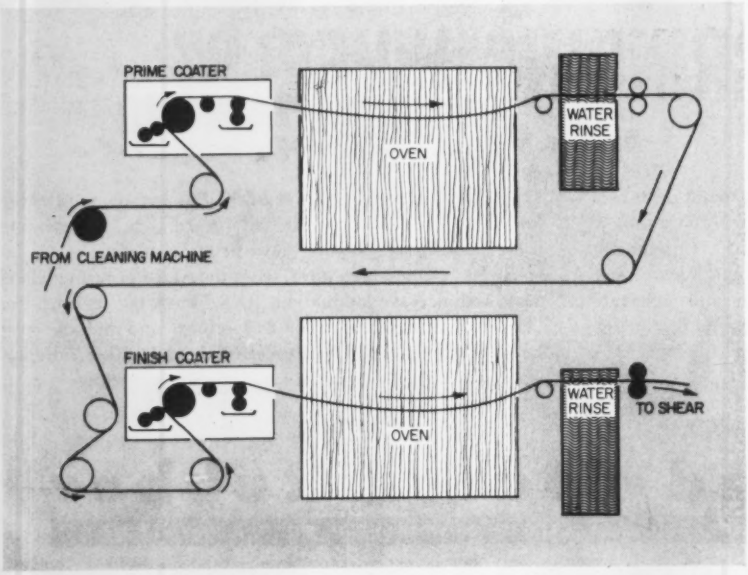


Coating machine, part of the processing line, handles strip 60 in. wide. Availability of wider coils broadens application of the prepainted material

Continuous Line Provides Wide Prepainted Strip

Two coaters, ovens, and water rinses, in series, permit prime and finish paint to be applied in one operation. (White areas indicate coaters)



FABRICATORS of steel and aluminum strip can eliminate a costly production operation by using prepainted material, formerly available only in narrow widths.

A number of strip producers are installing continuous finishing lines that will handle coils 60 in. or more wide. The product can be sheared, slit, formed, or pierced without damage to the painted surface.

The cleaning and preparation equipment and the baking ovens are supplied by J. O. Ross Engineering Div., Midland-Ross Corp., New York. Roll coating and coil handling machinery is furnished by John Waldron Corp., New Brunswick, N. J., a subsidiary of Midland-Ross.

• Broad application of the prepainted material has been slow to come, because wide coils weren't processed.

Fabricators have been able to obtain coated strip, or to apply the coating themselves, for several years. But narrow widths limited application to such items as venetian blinds, awnings, and siding for homes.

Improved coating technology was necessary before wider coils could be coated. Tracking control equipment was needed. Coating heads had to be machined to close tolerances. Allowances had to be made for longitudinal and lateral camber, and for strip thickness variations.

• Each coil is unwound and spliced to the one ahead of it. An accumulator insures even flow of strip into the processing line.

Coils are fed into the line from a two spindle turret uncoiler. Pivot arms are adjustable to accommodate various strip widths, and to center material in the processing line. Some uncoilers have air brakes, others electric brakes.

The two spindle unit saves space, and one coil can be placed on the empty spindle as another is being coated, preventing interruption of the process.

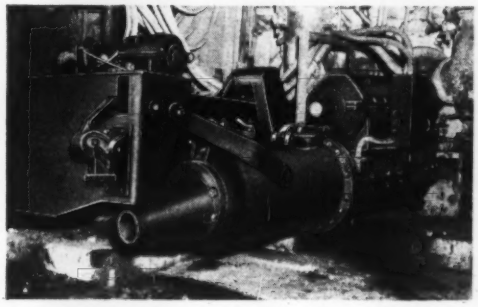
Feed rolls guide strip from the uncoiler into the processing line. Consecutive coil ends are sheared square and spliced; aluminum or light steel coils are stitched, but heavier gage steel coils are welded.

An entry bridle pulls strip from the uncoiler. When the strip is be-

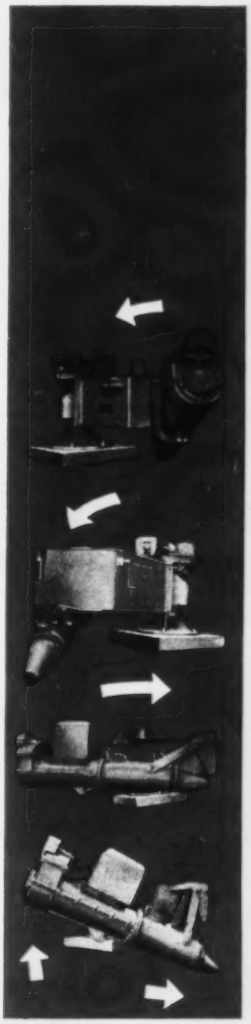
ACCURACY+POWER

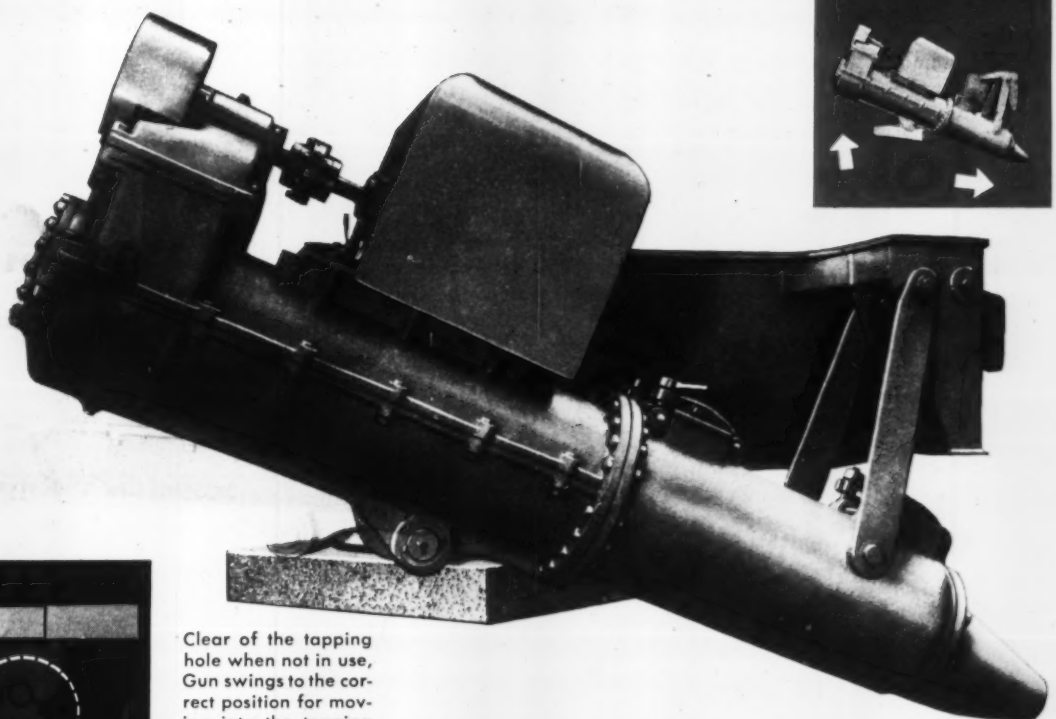
FOR MAINTAINING LONG TAPPING HOLES

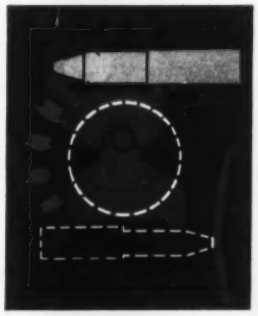
BAILEY CLAY GUNS



Precisely accurate due to unique mounting and 3-motor operation, Bailey Clay Guns furnish the high clay pressures (642 to 1150 psi) which are so necessary with the new coke-tar tapping hole mixes now being used on many furnaces. Designed for safety and reliability in blast furnace and large electric furnace applications, there are more than 170 in service. *Write for Bulletin.*







Clear of the tapping hole when not in use, Gun swings to the correct position for moving into the tapping hole.

WILLIAM M. **BAILEY** COMPANY · 1221 BANKSVILLE ROAD, PITTSBURGH 16, PA.

ing spliced, the bridle is stopped, and a pressure roll holds the trailing end of the coil in process, to keep it from continuing through the line. Flattening rolls dispose of burrs and other edge irregularities.

The entry accumulator stores a backlog of strip that can be processed while a splice is being made. It consists of fixed lower and floating upper rolls, and can hold a variable length of strip.

• Strip passes through a series of cleaning operations before it's painted.

Cleaning machines are available to treat aluminum, steel, or both. The material is cleaned, rinsed, and chemically treated. Then it passes through a cold water rinse and an acid bath.

Solutions can be heated by steam, immersed gas tubes, or electric elements. They're pumped through nozzles and sprayed on both sides of the moving strip.

Rubber covered squeeze rolls between the cleaning stages prevent solution from being carried from one tank to the next. Squeeze rolls at the exit end of the cleaning machine are moved automatically to one side or the other to compensate for improper alignment. After cleaning, the material is air dried.

• Paint is rolled on both sides of the strip, and baked dry in ovens.

Applicator rolls wipe on uniform coatings, pre-metered by chrome plated steel rolls that pick up the paint from coating pans.

The coated strip is air dried for a short distance, to permit solvent flashoff. Then it enters the drying oven, passing through one zone heated to 300° F, another heated to 450° F, and two more, heated to 700° F. Hot air is blown against both painted surfaces.

As strip leaves the oven, it's cooled by a water rinse, and dried by squeeze rolls. In some installations, an air blast is also used.

Sometimes, two sets of coating, drying, and rinsing equipment are used, permitting prime and finish coats to be applied in one operation.

An exit accumulator handles strip coming off the line while splices are being cut out with a shear and the leading end of the coil in process is threaded on the recoiler.

Revolution Underway in Machine Tool Industry

Mergers, imports, and more U. S. plants abroad represent trends that portend substantial change, says a builder. One result: Some domestic lines may be dropped

TEN YEARS from now, the U. S. machine tool industry may bear little resemblance to what it is today. That is the opinion of a leading builder. His conclusions are open to debate, but here's the way he sees it:

Most domestic machine tools will be built and sold by large corporations. Machines for the U. S. market will be built here. Machines for the world market won't be exported, but will be built in plants owned by U. S. firms in England, Europe, South America, and perhaps the Far East from U. S. engineering drawings. Machine tool exports will be limited to a few components not available abroad.

Only a few of the machine tool builders left will be small ones. The ones that survive will do so because of their ability to engineer and build unique, specialized machines. Flexibility will be a key to their survival; they will have to redesign or shift concepts as industry demands.

Some lines of machine tools built here now will be discontinued. Many will be standard models that will be produced by foreign builders or by foreign plants of the domestic builders.

• Why?—The builder cites three trends that will lead to the change, which already has started, and which he thinks may be completed in less than ten years.

First comes the already apparent mass increase of U. S. builders' facilities abroad. This, he figures, is just the first step. It will also become economical to establish a plant in South America, for example, to compete for the growing machine tool markets there. Then, the builders who are in hot contention for the world market will find it necessary to build other plants near other prime markets.

The second trend that could help create the new look is a decreasing number of U. S. builders. "At least for the last five years, we have seen small builders bought out by larger ones, family held companies selling out to corporations. As a result, major builders are building three, four, or five entirely separate lines, where a few years ago most had only one or two."

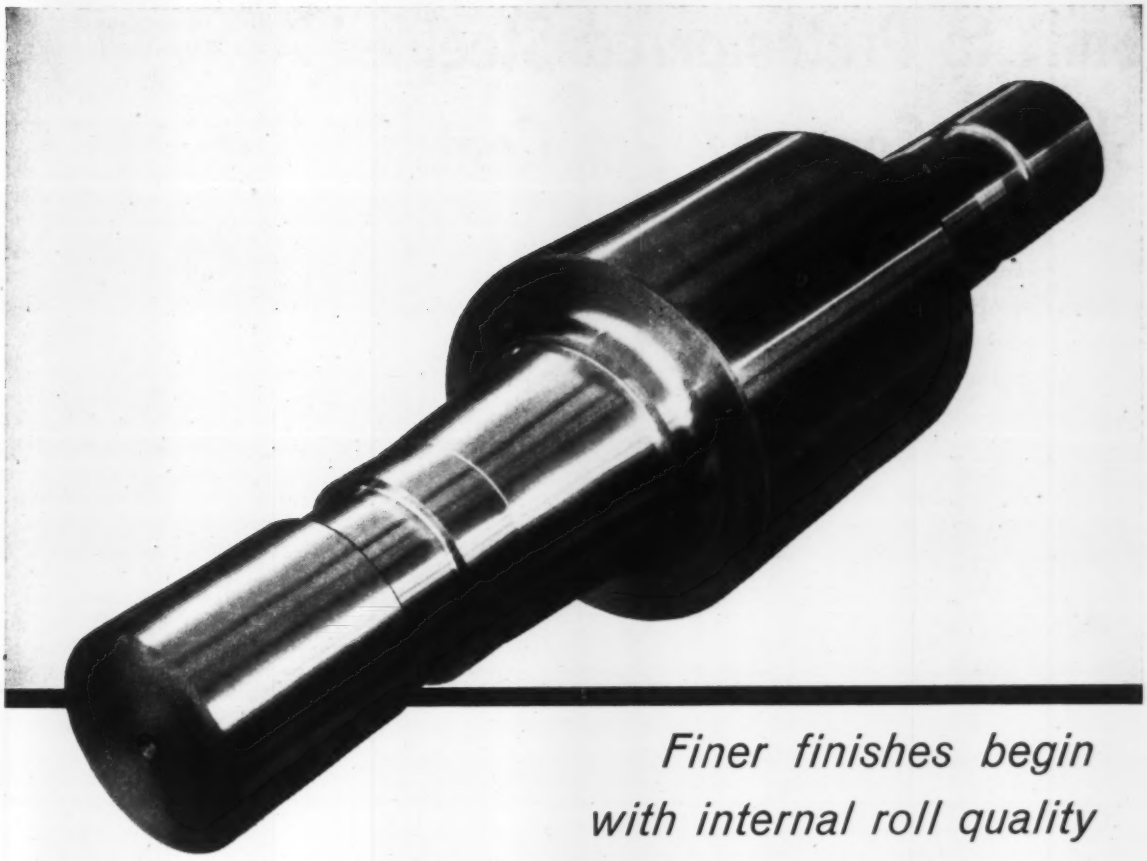
Finally, foreign builders, who have found eager market places in their own and neighboring countries where whole industries had to be rebuilt after the war, now have the time and the desire to concentrate on the lucrative U. S. market. Their low building costs and their advantageous tax provisions give them a handsome advantage over their direct competitors here. Some machine types may become totally unprofitable to build here, will be furnished entirely from abroad.

Thus, the builder guesses, the machine tool industry will be composed of fewer companies, with more plants abroad. And some standard U. S. machine tool favorites may be forced down the economic drain.

P.S.—The builder who made these guesses won't bet on them.

Tool Solution?

The Air Materiel Command, sponsor of many research studies on exotic machining methods, holds high hopes for one that seeks new cutting tool materials. A supermaterial, it reasons, could provide yesterday's machining economy (speeds, feeds, and tool life) on tomorrow's materials. The search is just getting underway.



Finer finishes begin with internal roll quality

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• The "how" of Birdsboro roll internal quality and surface strength, which result in finer finishes, is available to you now . . . along with details on the results you can expect. Contact your Birdsboro roll specialist. *Sales Department Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

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Shift to Pretempered Steel Slashes Costs 57 Per Cent

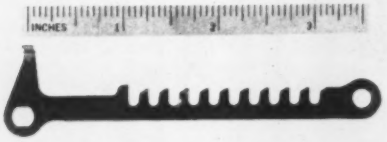
By switching material, Burroughs Corp. eliminated heat treating, tempering, and reworking of intricate parts for computer mechanisms of accounting machines

SAVINGS:

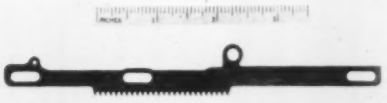
78%

88%

54%



43%



SWITCHING to pretempered SAE 1070 coil steel has helped Burroughs Corp. to eliminate heat treating and hardening operations at its Plymouth, Mich., plant on intricate parts for some of its business machines. Scrap rates have dropped from 24 to less than 1 per cent. Net costs have been cut 57 per cent.

• **Other Benefits**—Burroughs used to carry an 85,000 part inventory because of frequent die breakdowns. Now die maintenance is virtually eliminated, say company engineers.

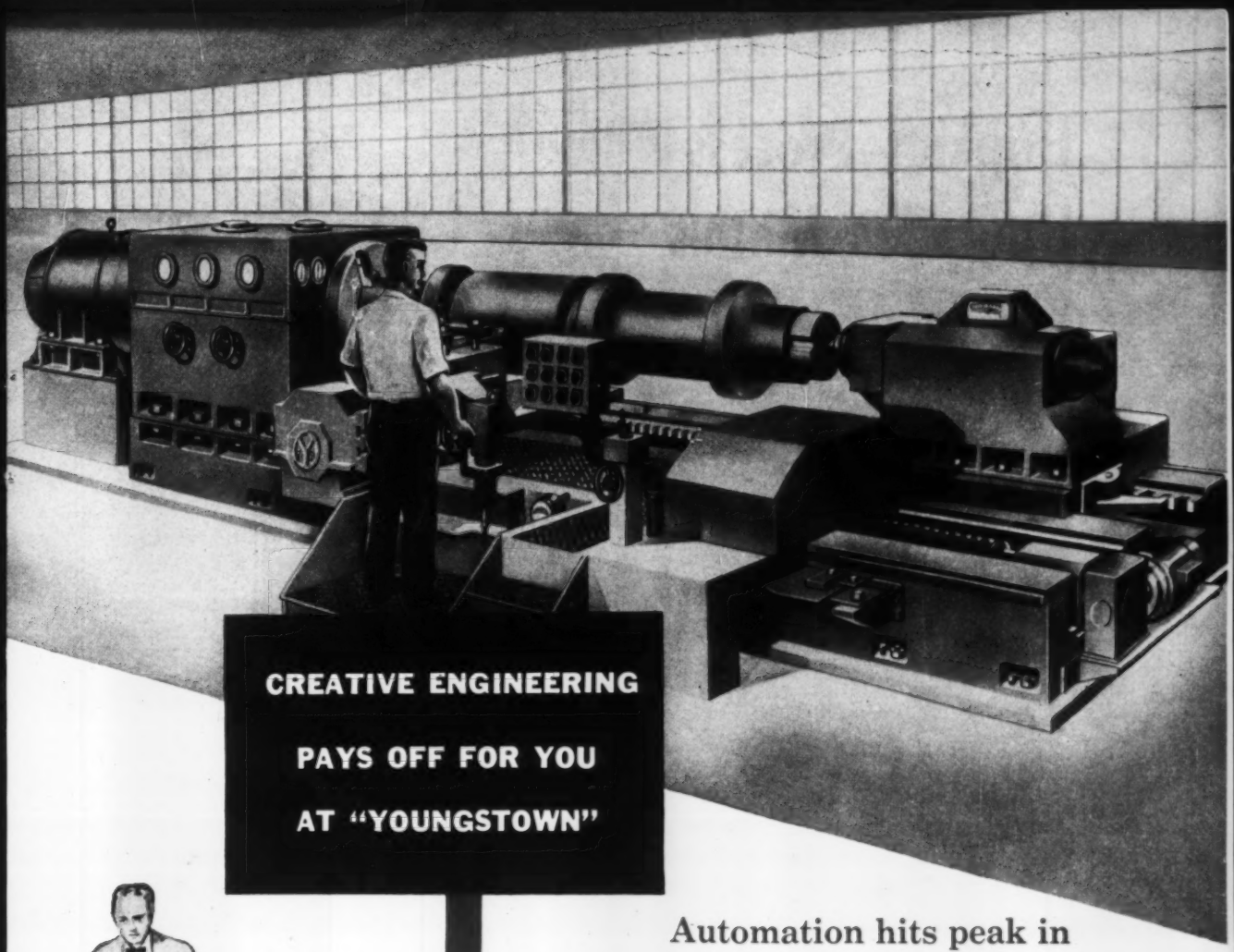
More important, 31 persons who used to be needed for straightening operations have been transferred to other jobs where they can be more productive. Only five regular production employees are needed now against eight formerly.

• **Requirements** — The four parts shown are critical because they go into the computer mechanisms of Burroughs accounting machines. Some 300,000 units of each part are needed for a year's production. Parts must be kept flat. Warpage tolerances are ± 0.002 in.

• **New Way** — The pretempered steel coils are fed into a 200 ton press equipped with progressive carbide dies. The steel comes in two thicknesses, 0.040 and 0.035 in. The thickness fed depends on which part is being run. Thickness tolerances are held to ± 0.001. Hardness is between 42 and 46 Rockwell. Blanking, perforating, and forming are done on carbide dies in five stations. Burroughs says it has no special problems with die lubricants. Die life averages 110,000 pieces per grind. When the dies are resurfaced, only about 0.003 in. has to be taken off.

Two ears on an accumulator rack part must be bent after the part is formed. One ear is bent at a 90 degree angle, the other at 60 degrees. To do that, Burroughs induction heats them, bends, and tempers them against a steel die block.

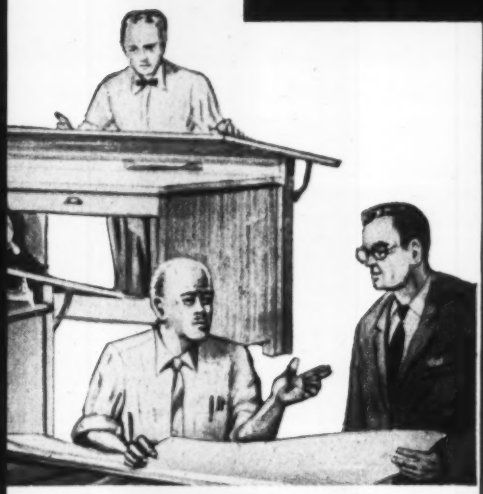
• **Old Way**—The company formerly used 1 in. wide coils of M-8340 steel. It was blanked, perforated, shaved, and formed in a 105 ton press. Heat treating and straightening followed. Two steel dies were used and die life averaged 10,000 to 15,000 pieces between grinds.



CREATIVE ENGINEERING

PAYS OFF FOR YOU

AT "YOUNGSTOWN"



"YOUNGSTOWN" quality begins with the progressive ideas of our engineering staff (example: our new roll lathe design). Consult us . . . particularly on such completely integrated projects as pickling lines, scrubber lines, slitting lines, shearing lines, extrusion presses and auxiliaries, furnace charging equipment, runout tables . . . Paralloy and ductile iron rolls . . . Custom built equipment . . . all benefiting from our ¾ century of experience.

Automation hits peak in "YOUNGSTOWN" CONTOUR ROLL LATHES

(Capacities 24"-36"-48"-60"-72")

The above sketch, made during construction, shows the typical design of "YF&M" contour roll lathes.

Automatically controlled, hydraulic or electric tracers which are "templet or numerically controlled" assure smooth operation, fine finish, and extremely close tolerances. Tool post and carriage are designed for use of either carbide-tipped tools or regular roll turning tools. Headstock has illuminated inspection ports . . . automatic lubrication . . . Timken roller bearings . . . herringbone gearing . . . Rugged throughout for extreme rigidity . . . No faceplate overhang. Higher headstock speeds can be furnished to accommodate ceramic tooling.

Heavy Duty spring-loaded tailstock with load indicator—avoids overloading of bearings. Housings—manually or hydraulically operated. Electric-Hydraulic Ragging attachment optional. Everything to meet specific requirements.

Write for complete information.

The Youngstown Foundry & Machine Co.

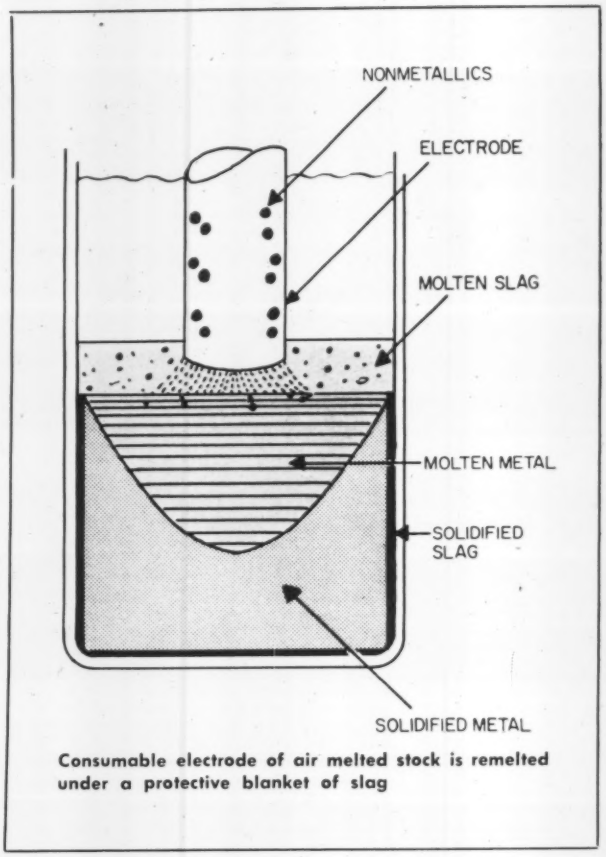
SERVING INDUSTRY SINCE 1885

Youngstown 1, Ohio

Hopkins Process Upgrades Metals For Critical Uses

Remelted material has these properties:

- **Minimum segregation.**
- **Nonmetallics removed or dispersed.**
- **Uniform analysis.**
- **Uniform physical and mechanical properties.**
- **Sonic soundness.**
- **Good ingot surface.**
- **Fine grain.**



Consumable electrode of air melted stock is remelted under a protective blanket of slag

SUPERIOR chemical, physical, and mechanical properties are claimed for steels and high temperature alloys remelted at Firth Sterling Inc., Pittsburgh, by the Hopkins process.

The company has acquired patents to the melting method (formerly called the Kellogg process), and renamed it (R. K. Hopkins was the inventor).

• Electrodes are melted under a **controlled slag, at a controlled rate, in a water cooled mold.**

The molten slag blanket protects metal from the atmosphere. It keeps undesirable elements out of the metal, and keeps desirable ones

Samples of A-286 alloy remelted by the Hopkins process were taken from a turbine wheel and mechanical properties were checked against requirements in AMS Specification 5735C. Stress rupture tests were made at 65,000 psi, 1200° F; notch tests were discontinued before the metal failed. Here's how the material showed performance extras in all test phases:

	TENSILE STRENGTH				STRESS RUPTURE STRENGTH		
	Tensile (psi)	0.2 Per Cent Yield (psi)	Per Cent Elongation	Per Cent Area Reduction	Stress Rupture Time (hours)	Per Cent Elongation	Notch Test (hours)
(Specification)	130,000	85,000	15.0	18.0	23.0	5.0	23.0
Rim (Tangential)	142,000	99,000	22.5	29.0	62.6	7.7	44.2
Midradius (Radial)	145,000	101,000	21.0	28.7	69.6	7.0	29.4
Center (Tangential)	143,000	99,000	22.0	26.0	66.2	7.2	31.6

in. It provides an ionized path to support and stabilize the arc. That helps maintain constant voltage and uniform arc length.

The slag has a damping effect on metal spatter, preventing it from collecting on mold walls and marring ingot surface.

As the metal and slag blanket rise in the mold, a thin slag shell solidifies on the inner wall. That keeps the metal from touching the mold wall as it freezes, improving ingot surface quality and preventing cold shuts.

• The process eliminates inclusions and prevents segregation.

Air melted material normally used for electrode stock in consumable electrode melting processes contains nonmetallic inclusions. In the Hopkins process, they float to the surface of the molten metal and become part of the slag blanket.

When materials containing titanium or reactive elements are melted, highly refractory compounds are often produced. The slag blanket absorbs them from the molten metal.

Even in high speed steel, which is extremely susceptible to carbide segregation, the process is effective. Controlled melting and freezing rates prevent segregation.

• Metals produced by the process are said to have superior physical and mechanical properties.

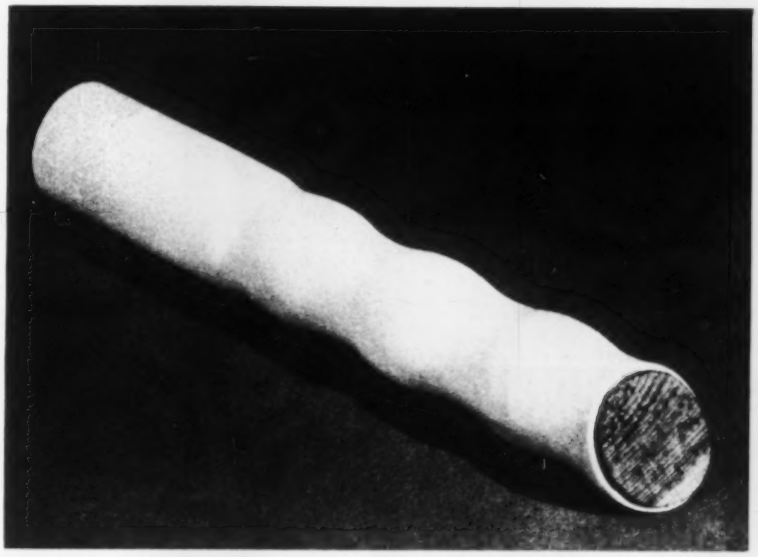
Performance of the materials is predictable at high or low temperatures. Forgings are uniform, and properties vary little from one ingot to another remelted from the same heat of electrodes.

One metal—SAE Type 4340 steel—when melted by the process and heat treated to about 280,000 psi tensile strength, is said to have excellent ductility as cast. Ductility is still better after forging.

The company is producing materials that exceed specifications for critical uses, but feels the potential of the process hasn't been fully exploited. Improvements are being made in the melting technique to produce fine grained ingots. The grain structure, with proper forging and rolling, can be retained in the finished product.

As new alloys are developed, they will be purified by remelting under appropriate slags.

Shrinking Plastic Solves Some Problem Jobs



Shrinking a piece of heavy-walled plastic tubing over a pattern demonstrates the degree to which the plastic will respond. This approach would make an ideal grip for a handle, for example

A NEW shrink fitting plastic is helping metalworking solve some of its unusual problems.

Take the latest electronic vacuum cleaner made by Lewyt Mfg. Corp., Long Island City, N. Y. The motorized beater-sweeper gets its 8 volt power through the wand, or handle, which is connected to its low voltage source by spiral wires embedded in the flexible portion of the hose. The metal tubing connectors at both ends of the wand are insulated with simple tubes made of a clear shrinking plastic.

Lewyt claims the solution cost much less than its original approach—winding tape around the metal. The plastic also shrinks around the metal projections on the wand to provide a perfect anchor.

Designers have also used the plastic for a decorative cover. The metal legs of photographic tripods, for example, are covered with a fluted tube which can be easily shrunk into place.

• The material costs about 10 per cent more than regular cellulose acetate.

The maker, Anchor Plastics Co., Long Island City N. Y., says you can get the material in finished, extruded forms like round or rectangular tubes or special shapes like moldings. It comes in opaque, translucent, and transparent colors, and it doesn't age—some tested for many months hasn't shown any physical change.

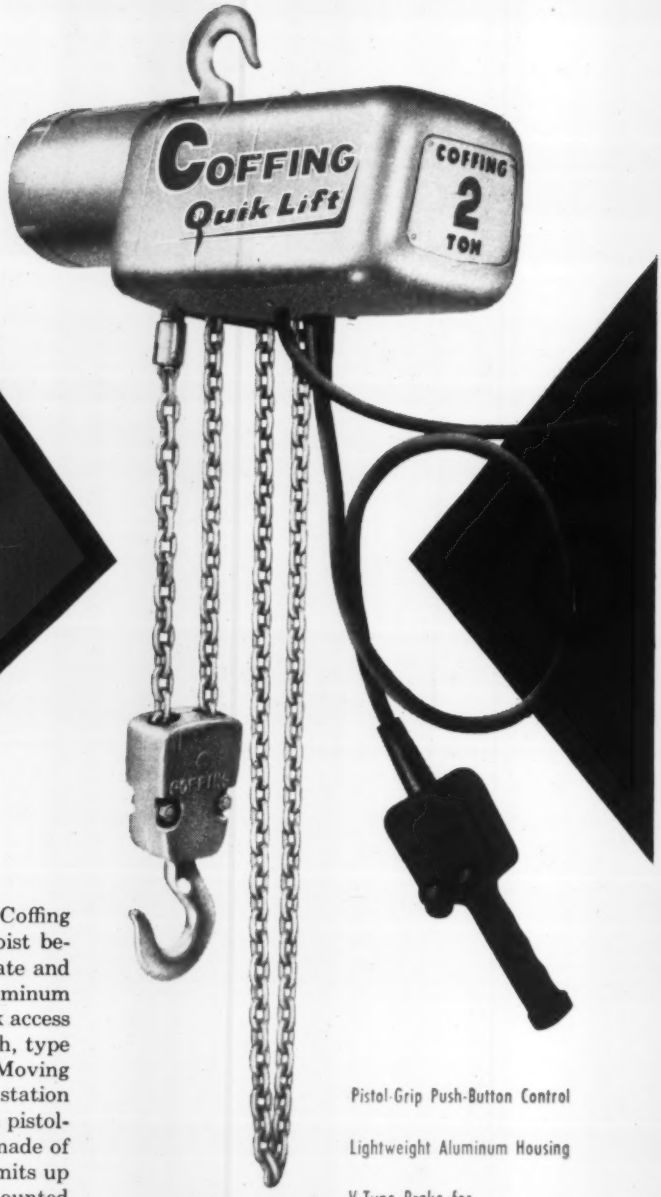
Shrink fit tubes or moldings are shipped dry, like extrusions. (The material looks like regular plastic.)

To activate the plastic, it is immersed in a regular solvent (Anchor says it's inexpensive) for about 15 minutes. (You can leave it in much longer without damage.) It is then ready to be put on any assembly.

Shrinking takes place during drying. Assemblies can be handled within 20 or 30 minutes after application. The part is entirely dry in atmosphere in 24 hours.

COFFING Quik Lift Electric Hoist

20 Models in Capacities from 1/4 to 2 tons



Workmen like the new Coffing Quik-Lift Electric Hoist because it is easy to operate and light to handle. The aluminum housing is in sections for quick access to change voltages, limit switch, type of suspension or chain. Moving the Quik-Lift from station to station in your plant is simple and fast. The pistol-grip push-button control station is made of non-conducting plastic. Its design permits up or down operation while pulling trolley mounted hoists. Power to the controls is reduced to 115 volts for added safety. For new hoist efficiency specify Coffing Quik-Lift. Your Coffing distributor has them in stock and will give you complete details, or write for Bulletin ADH-65.

DUFF-NORTON

- Pistol-Grip Push-Button Control
- Lightweight Aluminum Housing
- V-Type Brake for Maximum Braking Surface
- Easily Adjusted Limit Switch
- Complete Line of Accessories

RATCHET LEVER HOISTS

QUIK-LIFT AIR HOIST

CHAIN HOISTS

COFFING HOIST

DIVISION OF

DUFF-NORTON COMPANY

813 Walter Street • Danville, Illinois

Gage Checks Thickness, Draws Profile of Sheet

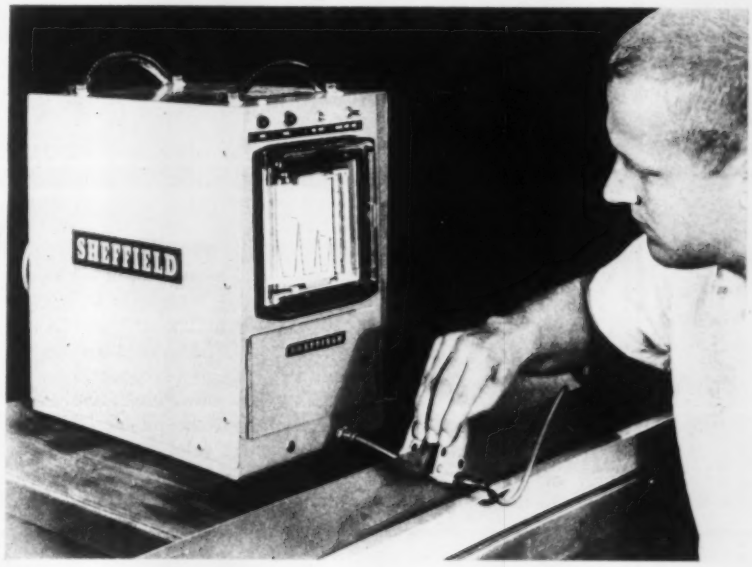
OPERATIONS can be speeded if you use Sheffield's pneumatic gage recorder to simultaneously air gage and record the thickness of sheet stock at preselected gage points. It's many times faster than checking sheets with a mechanical gage and writing down each size reading.

The instrument is ideal for manufacturers and users of sheet stock —steel, aluminum, plastic, missile skins, precision stampings — who must make a statistical examination of sheet thickness to prepare a profile or a calibration certificate.

To operate the instrument, the inspector moves the size-sensing element along the sheet (or the sheet can be moved through the gage head) and size deviation is automatically recorded on a 4 in. wide strip chart.

Chart travel can be intermittent or continuous.

Both contact and noncontact air gage tooling can be used with the pneumatic gage recorder which offers a full scale tolerance from ±0.0003 to ±0.040 with proper tooling. Because the instrument accommodates interchangeable tooling, internal as well as external dimensions can be inspected.



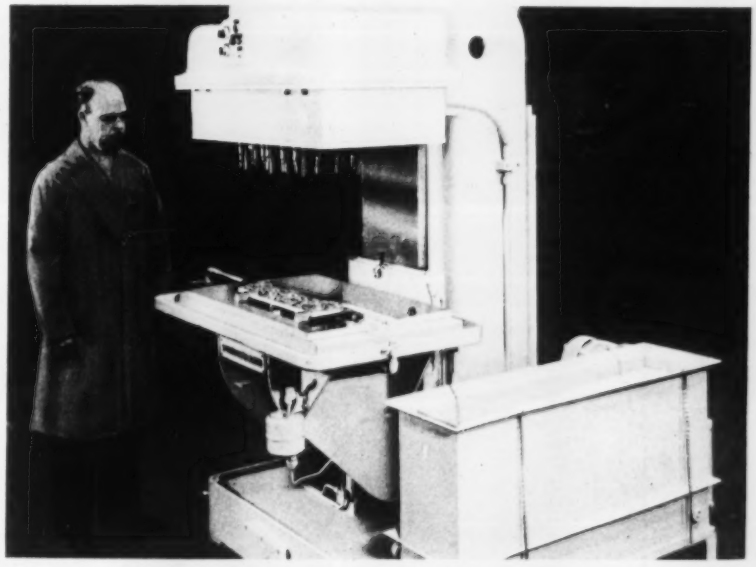
For more information, *write* Sheffield Corp., Dayton 1, Ohio.

Multiple Drill Has Minimum Spindle Center Distances

RELATIVELY low cost head assemblies can be developed for the Sundstrand multiple spindle drilling, boring, reaming, and tapping machine using low cost spindles and parts to minimize original equipment outlays.

A wobble plate drive eliminates all gearing in the work heads. Elimination of gearing to drive the spindles minimizes center distances. Similar parts with a few different holes can be accommodated by providing additional spindles which can be quickly fitted.

When a major changeover is made in work being produced, about 75 per cent of an obsolete head can be salvaged and applied to new jobs. Complete drill heads temporarily out of service or por-



tions of drill heads can be stored in a small space and reassembled when the job is repeated.

Outstanding accuracy is provided. Tolerances to 0.0002 in. can be held for spatial relationship, shoulder depth, and hole size. The machine is designed for work with nonferrous metal parts. Feed rate for drilling, rough and semifinish boring in aluminum and magnesium are 0.005 to 0.008 in. per revolution.

Finish boring in the same materials is done at 0.0005 to 0.001 in. per revolution.

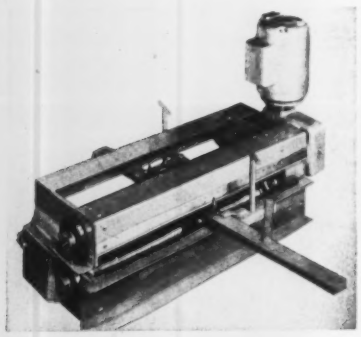
For more information, *write* Sundstrand Machine Tool Div., Sundstrand Corp., Belvidere, Ill.

Power Slitting Shear Comes in Three Sizes

THREE SIZES of power slitting shears are available in the Beverly line with capacities for 10, 14, and 20 gage mild steel. All three have deep throats and rugged and easily adjusted back gages.

Two reversible, high carbon, high chrome cutters are driven by a heavy duty gear set connected to a completely enclosed worm gear drive. An electric motor is connected to the worm gear housing for safe, positive operation. Cutters are interchangeable.

The back gage is clamped to both sides of the heavy machine frame to withstand stresses caused by the cutting action as sheets are fed through the machine. Sheet retention and alignment is held by the back gage slide bar. If free hand slitting is desired, the back gage may be quickly removed leaving the entire machine throat open.



Etched scales on either side of the machine permit direct reading and quick setting of any cutting width from 1½ to 30 in.

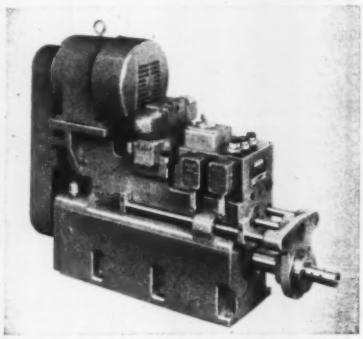
A sheet retaining roller (spring loaded) automatically applies correct pressure to the inside cut edge of the sheet to insure a straight accurate cut.

For more information, *write* Beverly Shear Mfg. Co., 3004 W. 111th St., Chicago, Ill.

Hydraulic Quill Type Unit Uses Standard Components

THIS quill type, hydraulic power unit provides maximum utilization and economy for single or multiple drilling, reaming, counterboring, spot facing, and limited boring, milling, and similar operations.

Standard components are used in the design of the power unit. Most of the parts used are interchangeable with other makes and are normally carried in the user's inventory and supplier's stock.



The unit can be operated by hand or automatically from a remote location. Multiple units can be arranged for operation from a single hydraulic reservoir, and multiple setups can be operated simultaneously in sequence on any desired cycle.

For more information, *write* F. Jos. Lamb Co., 5663 E. Nine Mile Rd., Detroit 34, Mich.

Positioner Holds 2000 lb

QUICK precise positioning of heavy, odd shaped work for welding or fabrication can be done on the PM-1051 work positioner.

It will handle titanium and other superalloy weldments weighing as much as 2000 lb. Its 32 in. table (42 in. optional) has six milled tee slots for jigs or fixtures to accommodate a variety of shapes.

The table tilts from "work vertical" position to "work 15 degrees below horizontal" position. The desired tilt angle is set on the protractor, and the tilt button on the operator's control panel is depressed for momentary contact. The table stops automatically when the work reaches a preselected position.

The table rotates through 360 degrees in either direction. Rotation speed can be varied continuously up to 4 rpm.

For more information, *write* Boesch Mfg. Co. Inc., Danbury, Conn.

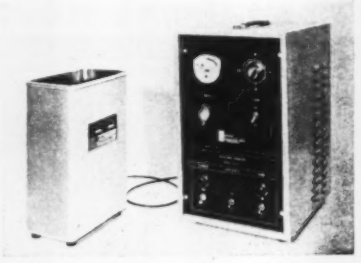
Ultrasonic Cleaning Unit Has High Energy Density

THIS ULTRASONIC cleaner is designed for use where a high energy density is required. It has 44.5 per cent of the tank bottom covered with driving elements. Actual radiating surface is 24 sq. in.

The two gallon tank (10 x 9 x 6 in.) is made of heavy gage polished stainless steel.

The unit (115 volts ac, single phase) is designed for continuous operation. Average power output is 125 watts with peaks of 500 watts.

It has a 0 to 60 minute timer,



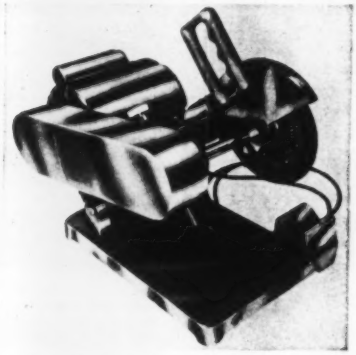
one tube oscillator, a circuit breaker, and three-wire ground protection. Provision is made for remote control and front panel switching between a choice of two transducers.

For more information, *write* National Ultrasonic Corp., 111 Montgomery Ave., Irvington, N. J.

Dry Abrasive Saw Runs Cool at High Speeds

THIS HIGH SPEED cutting machine can slice metals or nonmetals with a 1/32 in. thick wheel. It's cool running, minimizes burn, and requires little or no hand finishing.

The unit can cut a square inch cross section of hardened steel in 3 to 6 seconds without changing Rockwell or psi readings. It cuts faster in tubes, pipes, shapes, and extrusions, and leaves clean, smooth surfaces without burrs.



The heavy duty production unit weighs 60 lb and is portable for shop or field operations.

The machine is powered by a 3/4 hp motor (3450 rpm) and uses a 7 in. diameter cutting wheel.

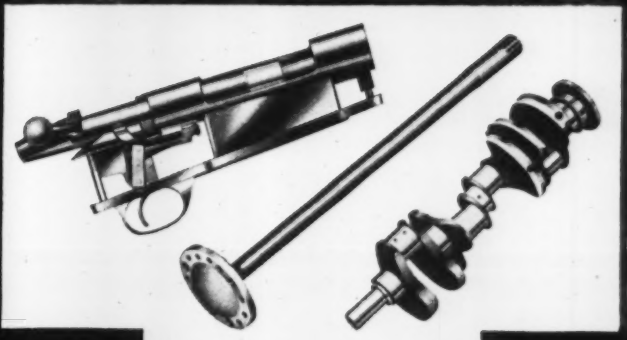
For more information, *write* Crabtree Mfg. Co., 903 N. Bagley St., Dallas 11, Tex.

Switch Replaced Easily

YOU CAN replace this heavy duty, oiltight limit switch without disturbing wiring. It has a power plug which connects the power cable to the switch with a threaded coupling.

To replace a switch mechanism,

VALVOLINE
Tectyl
protects metals
against RUST



VALVOLINE'S amazing Tectyl rust preventives protect metal surfaces against *every kind of rust and corrosion* during storage and shipping.

Low-cost Tectyl compounds are easy to apply by brush, spray or dip and just as easy to remove. They protect metal surfaces against . . . sun and rain . . . heat and cold . . . salt air and salt water . . . humidity, perspiration and corrosive fumes.

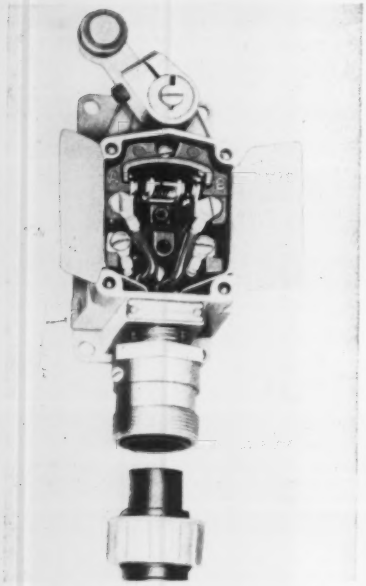
Tectyl rust preventives meet exacting government specifications.

Write today for these two helpful Tectyl charts

1. "Valvoline Tectyl U. S. Government Approved Packaging and Preservative Chart." Gives the Army, Navy and Air Force "Specs" and applications.

2. "Valvoline Tectyl Industrial Rust Preventive Comparison Chart." Specifies applications covering the entire field.

VALVOLINE
Tectyl
ALL-METAL PROTECTION
RUST PREVENTIVES



remove the four mounting screws, disconnect the power cable, and lift off the switch. A new switch can then be mounted and the power cable reconnected.

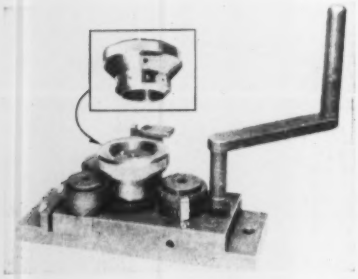
For more information, *write* Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.

Fixture Aids Marking on Circumference of Parts

EQUALLY spaced numbers or figures can be stamped on the circumference of metal parts with the Model GRD-950-1A marking fixture.

The fixture can be adapted for graduation marking where extremely close tolerance is not required. The unit illustrated is used for marking around the circumference of a dial handle for a flow control valve.

The unit has three main components: A circular marking die, a mandrel for holding the part being marked, and an operator's handle. The units are geared together to provide synchronized rotation of the part and the marking roll.



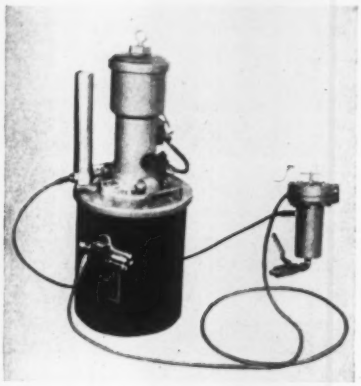
For more information, *write* M. E. Cunningham Co., 1025 Chateau St., Pittsburgh 33, Pa.

Airless Spraying System Eliminates Overspray

MATERIAL savings averaging 40 per cent can be expected with the HydraAirless 20 spraying system because overspray is virtually eliminated.

No spray booth is needed, even in open areas. No atomizing air or heat is required and no elaborate precautions need be taken for health or safety.

A feature of the system is the ease of conversion from standard unheated airless spraying to full temperature and viscosity control. That is accomplished by the quick attachment of the Spee-Flo heater



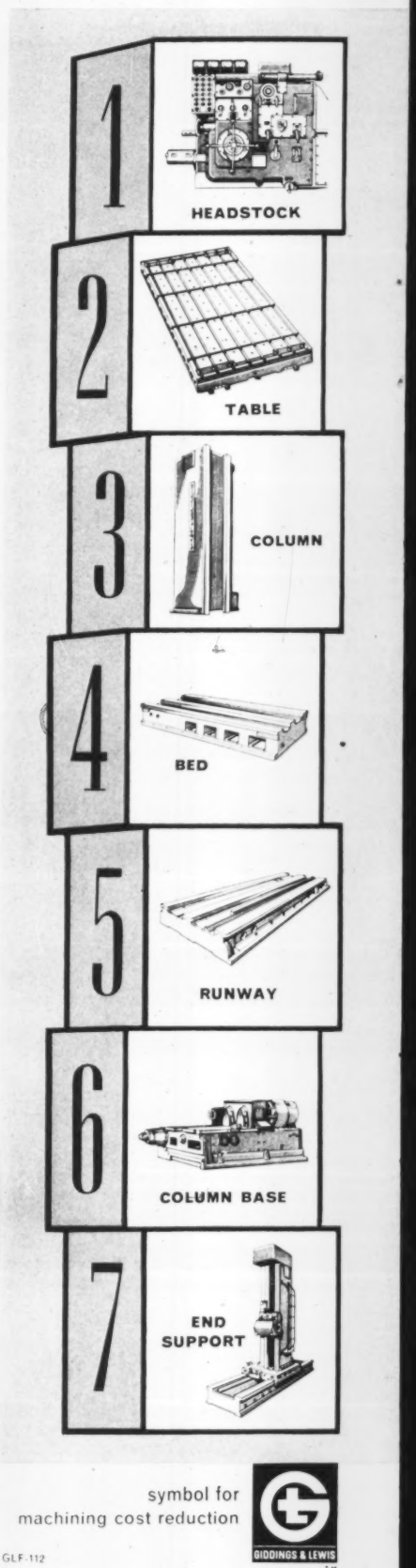
and recirculating assembly to the basic unit. All models in this line are available in fixed or mobile units for 5 or 55 gallon requirements.

For more information, *write* Spee-Flo Co., 6614 Harrisburg Blvd., Houston 11, Tex.

Pneumatic Riveter Has Blade Hopper Attachment

STRAIGHT feed of difficult-to-feed parts such as long tubular rivets, collar studs, and threaded or knurled parts is accomplished with the Model 56-BH riveting machine.

The setting machine portion is



GIDDINGS & LEWIS
T. M.

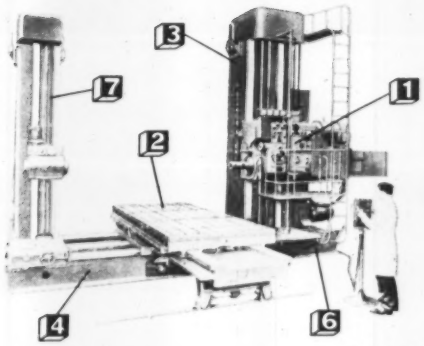
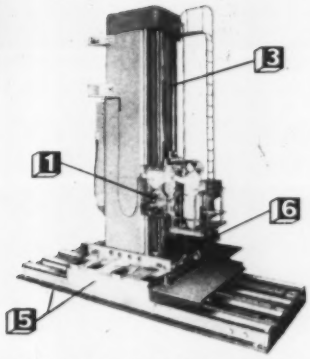
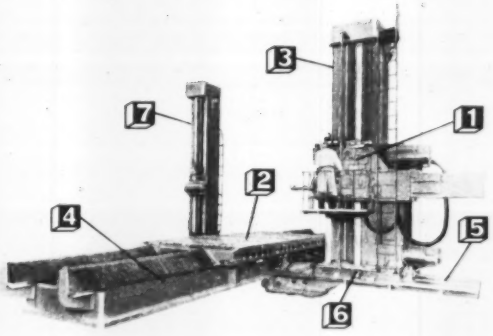


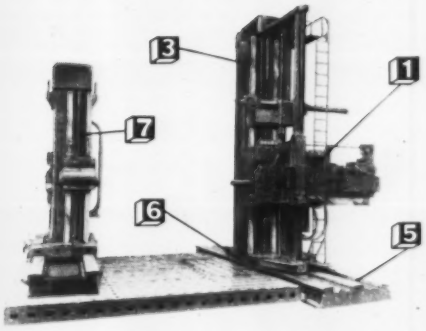
TABLE TYPE



FLOOR TYPE WITH CROSS SLIDING COLUMN



PLANER TYPE



FLOOR TYPE

G&L building-block principle cuts cost . . . gives you more for your money

When you order a Giddings & Lewis horizontal, you get a machine custom-built to your requirements at the price of a standard machine because it will be built up of interchangeable building-block units.

This building-block concept has long been used by G&L to reduce manufacturing costs and to make possible extra features and extra quality at competitive prices.

There is an almost unlimited variety of arrangements possible with standard components. This, together with the most complete line of attachments and accessories available, enables you to specify the machine that best suits your requirements without paying the price penalty normally associated with custom-built equipment.

Every Giddings & Lewis horizontal is an extremely rugged and precise instrument for removing metal. Heavy-duty construction with generous safety factors enables G&L machines to take on the really tough jobs, while at the same time delivering toolroom capabilities and accuracy — all at the price of a standard production machine.

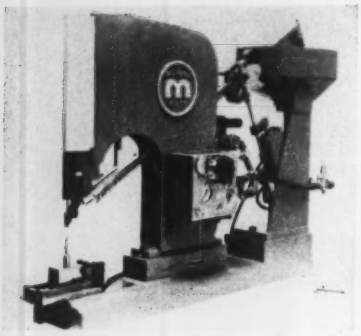
For horizontals "designed" to your shop requirements — for machines with the versatility, accuracy, and ease of operation that spell greater production and profits — consult your local Giddings & Lewis distributor or write today.

• • •

World's most complete and versatile line of horizontal boring, drilling, and milling machines.

GIDDINGS & LEWIS MACHINE TOOL COMPANY • Fond du Lac, Wisconsin

Giddings & Lewis manufactures: vertical and horizontal boring machines, vertical turret lathes, planers, planer mills, contour milling machines, die sinking machines, drilling machines, numerical and tracer control systems, boring tools and related items, and machine tool accessories.



actuated by a pneumatic cylinder that drives the setting tool through toggle linkage. The blade hopper is independently driven through a separate air cylinder. The hopper system may be continuously cycled or operated intermittently.

The unit can be used in conjunction with fixed position setting tools, in-line slide fixtures, or rotary tables to suit a wide range of product applications and assembly operations.

For more information, *write* Milford Rivet & Machine Co., Milford, Conn.

Compact Burning Machine Cuts, Bevels Steel Beams

YOU CAN cut and bevel beams on the Alamo machine in one setup. Adjustments are built into the unit to make square, vertical, or horizontal cuts within close tolerances.

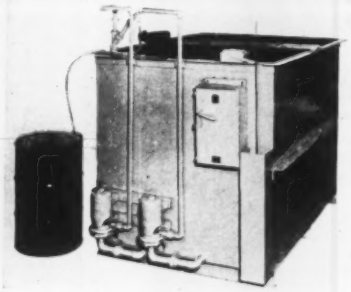
The beam cutter and beveler cuts with a torch. Structural shapes may be squared and beveled simultaneously, simplifying and speeding preparation for welding.

For box columns, channels, and angles, three sides may be cut on the same setup. Mitre cuts up to 45 degrees can be made with simple attachments. The machine will square and bevel all angles, as well as 36 to 48 in. I-beams and cut and bevel plates to lengths up to 60 in. wide.

For more information, *write* Alamo Iron Works, Hoefgen and Montana Streets, San Antonio, Tex.

Low-Cost Cyanizer Needs No Operator

OPERATION of the Model 6444 Cyanizer is automatic and continuous. No operator is required. It treats cyanide waste from plating operations with sodium hypochlorite.



The package machine contains a sump tank, baffle tank, pumps, and controls. Cyanide wastes are collected in the sump and pumped into a specially designed baffle tank for neutralization. Wastes remain in the tank for 1 hour, can then be dumped into municipal sewer systems with complete safety.

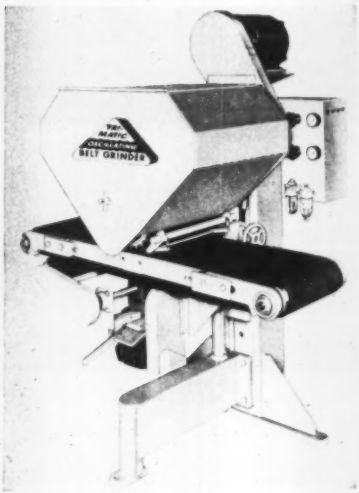
For more information, *write* George L. Nankervis Co., 15400 Fullerton Ave., Detroit 27, Mich.

Oscillating Belt Grinder Descales and Polishes

THE CONTROLLED oscillating movement of the abrasive belt in the Tri-Matic grinder provides faster cutting, less loading, and longer belt life through shearing action.

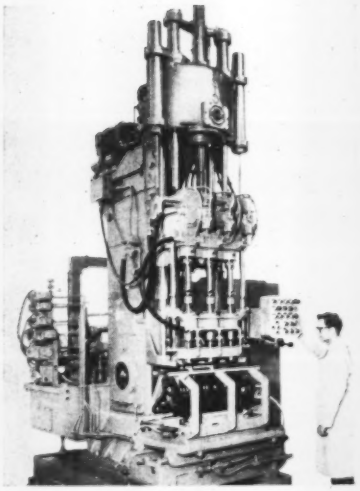
The problem of belt tracking is eliminated on any belt width from 6 to 12 in. To change belts, you only have to slip one off and another on.

Belt oscillation is maintained and controlled by air-jet sensing. That



activates electronic controls and imparts a continuous oscillating action with variable and adjustable lateral travel, and lateral travel speed. Oscillation is accomplished without changing the length of the belt path and without undue tension.

For more information, *write* Sales Service Mfg. Co., 2363 University Ave., St. Paul 14, Minn.



THIS HONING MACHINE (Barnes Drill No. 4014 3-spindle vertical type) has individually controlled pneumatic hone feed for each spindle. Varying operating conditions caused by bore size irregularities and different degrees of stock hardness are compensated. Advantages: Shorter cycle time, improved bore conditions, and reduced stone wear. For more information, **write** Barnes Drill Co., 854 Chestnut St., Rockford, Ill.

NEW Literature

Write directly to the company for a copy

Punching, Notching Machine

A general catalog describes the Strippit system of punching, notching, nibbling, and drilling. Wales-Strippit Inc., 210 S. Buell Rd., Akron, N. Y.

Muriatic Acid Manual

A 44 page illustrated manual covers the history of muriatic acid, properties of the acid solutions, principal reactions and uses. Inorganic Chemical Sales, Dow Chemical Co., Midland, Mich.

Stainless in Architecture

"Architecture and Allegheny Stainless" is a 50 page booklet which gives stainless steel ideas on design and application in the architectural field. Advertising Dept., Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.

Liquid Spray Buffing

Bulletin LIQ-600 gives automatic liquid spray buffing data on setup and operating procedures for automatic buffing, burring, and polishing. Lea Mfg. Co., 16 Cherry Ave., Waterbury 20, Conn.

Free Machining Steel

Physical properties of Jalcase 100, a free machining, stress stabilized, cold finished steel bar, are covered in an 8 page booklet. Public Relations & Advertising Dept., Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

Descaling Machine

Bulletin 609 describes the complete line of Rotoblast descaling machines. Pangborn Corp., Hagerstown, Md.

Linear Conversion Table

A handy reference chart converts inches and fractions of inches into decimal parts of a foot. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

Welding Carbon Products Manual

An instruction booklet describes how to use carbon plates, rods, and paste to speed welding repairs. Arcair Co., P. O. Box 431, Lancaster, Ohio.

Carbide End Mills

A catalog covers Kennametal's line of precision ground, fluted end mills in 15 styles from solid bars of tungsten carbide. Also included is a table of suggested cutting speeds and feeds for 19 metals and nonmetallic materials. Kennametal Inc., Latrobe, Pa.

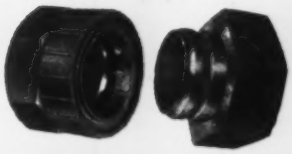
Tips on Ultrasonic Cleaning

An explanation of ultrasonic principles, a description of the equipment needed, and answers to 17 frequently asked questions are given in a 12 page booklet. Circo Ultrasonic Corp., 51 Terminal Ave., Clark, N. J.

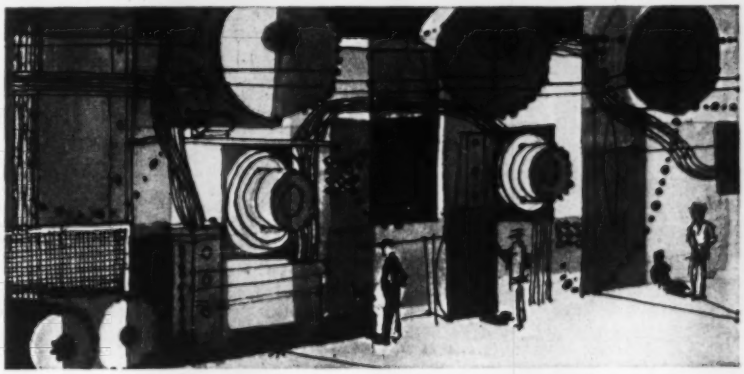
Roylyn

ALL PURPOSE

OPEN COUPLINGS



INDUSTRIAL COUPLINGS



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- Ease of Operation
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- Maximum Efficiency
- Rugged Construction

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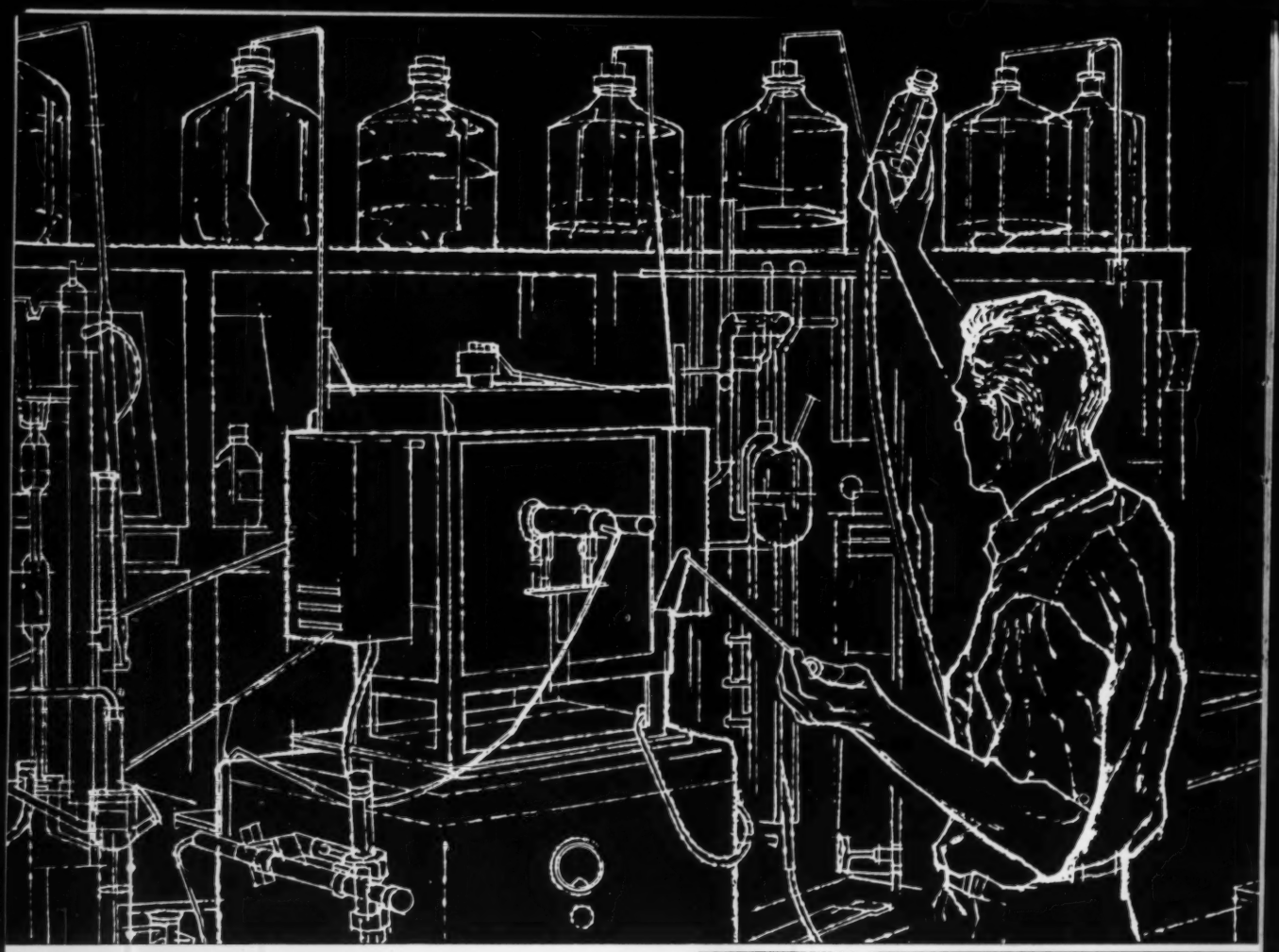

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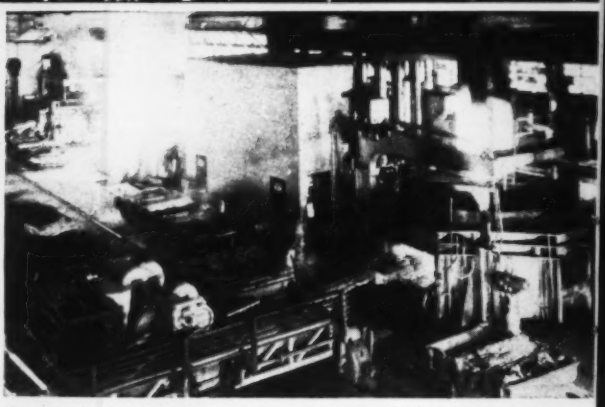
Controlled analysis is one of the basic factors necessary for quality strip steels.

J&L offers you an experienced organization devoted to strip steel processing combined with fully integrated melting facilities designed for **controlled** analyses.

J&L's leadership in the use of basic oxygen converters, high standard open hearth practice and electric furnaces permits melting to more accurate analysis ranges than usually considered necessary. Above all, they assure cleanliness with residuals and inclusions held to a minimum.

With an organization experienced in specialized strip steel processing, your standard or most rigid specifications can be met consistently.

For your convenience, precision strip facilities are available to you in our plants at Youngstown, Indianapolis, Los Angeles and Kenilworth (N. J.)



J&L offers all three—basic oxygen converters, high standard open hearth practice and electric furnace melting to meet your **restricted specifications.**

STRIP

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS
TEMPERED SPRING STEEL • ZINC AND COPPER COATED

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

August 24, 1959

Steelmakers Predict High Fourth Quarter

LOOK for steelmaking operations to average at least 85 per cent of capacity during the fourth quarter if the strike ends by Labor Day. If there's no settlement until October, you can expect a fourth quarter peak of 94 per cent. That's a higher rate than the industry reached at any time during the first half.

Demand would support a higher rate than 85, but start-up problems after the strike and year-end holidays will cut production. Major markets will be as strong as they were in the first half. Rails, the only items that were weak, will be trending upward, as will the production of capital equipment. Automakers are forecasting a banner year: 6.4 million American built cars (vs. this year's estimated 5.7 million).

SMALLER INVENTORIES—Since users won't have to worry about another strike for the duration of the next contract, they won't rebuild their inventories to the record prestrike levels. Even if consumption continues on a high plateau, they'll be cautious about stockpiling. They may boost their stocks back to 20 million tons, a level that's slightly above normal, but they won't go back to July's 26 million.

SECOND BEST QUARTER?—The ingot rate may reach its highest point of the year in November or December, but fourth quarter operations probably won't average as high as the second quarter's 91.8 per cent. Unless the strike is settled by mid-September, October will have a slow start. Steelmakers will need at least three weeks to get production over the 90 per cent mark.

NEW ORDERS HELD UP—Steelmakers are doing everything in their power to discourage fourth quarter bookings. District sales offices are simply filing orders; they won't be entered on mill books until the strike ends and production schedules can be set up. Backlogs are so big that most mills couldn't ship anything they booked now until December, even if they resumed production immediately.

CONSUMERS REPORT—In the latest survey of inventories (see Page 45), STEEL finds that 53 per cent of the consumers have enough metal to continue normal operations until early October or later; 47 per cent say their stocks will be depleted before then.

SPOT SHORTAGES NOTED—At Pittsburgh, structural fabricators are running out of wide flange beams, and service centers are in no position to help them. (In the East, fabricators are more concerned about the lack of jobs than the status of their inventories. Highway work is being held up for want of federal appropriations.)

At Chicago, there are spot shortages in galvanized sheets, hot and cold rolled sheets and strip, and plates. In the Southwest, small sizes of oil country tubing and casing are in short supply. Tubemakers fear that their outlets in Kansas City will be understocked during the winter. Reason: No barge shipments can be made after Oct. 15.

OUTPUT UNCHANGED—Last week, steelmaking operations held at 12 per cent of capacity. Production was about 340,000 ingot tons.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	109	117
Reinforcing	...	118
Boiler Tubes	...	120
Canada	113	123
Clad Steel	...	121
Coke	111	123
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*Current prices were published in the Aug. 17 issue and will appear in subsequent issues.

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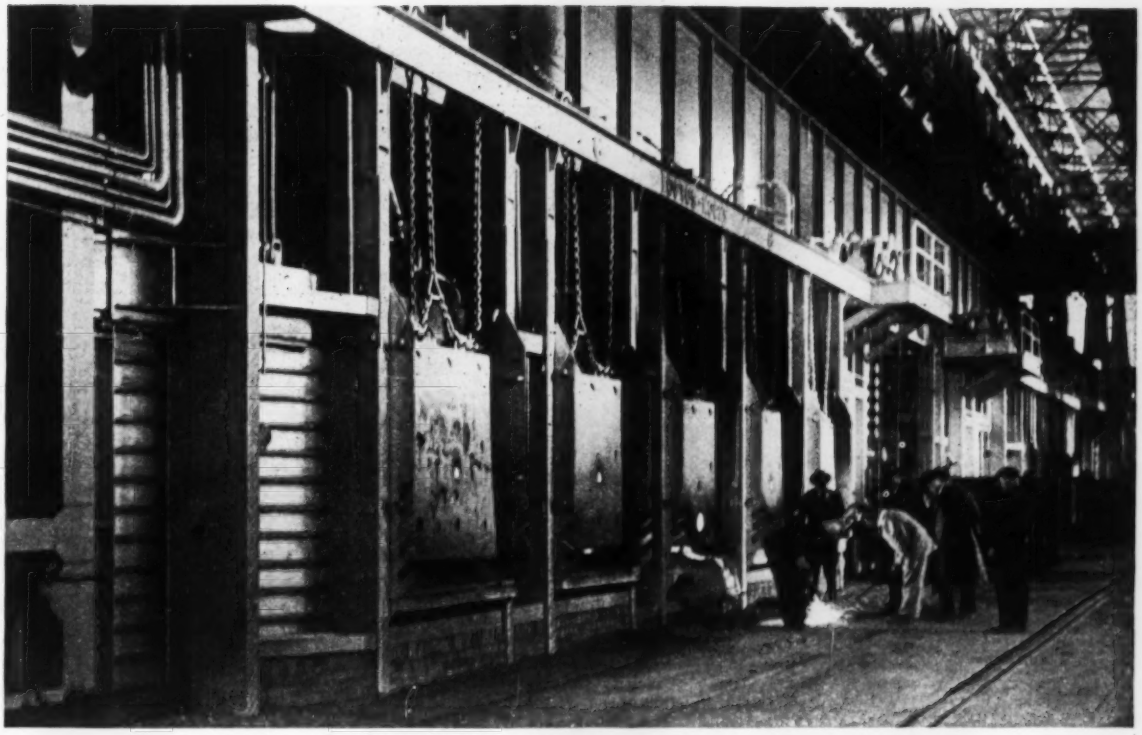


More steel from this Thyssen and other foreign mills is entering the U.S., but . . .

Our Steel Strike Worries Germans

GERMANY IS WORRIED about the length of the U. S. steel strike. German steel executives see no permanent sales advantages from a continuing shutdown here. They fear depressive and deflationary influences. It is generally hoped the steelworkers will be on the job by Labor Day.

German steel production is at a monthly rate of 2.5 million net tons, a record annual pace of 30 million tons. Orders for rolled steel are on the upturn. Backlogs are at an all-time high. Inventory buying is increasing because customers are concerned about deliveries. Demand for structurals and bars is particularly high. Deliveries run to five months. Demand for wire rods is also up. The only depressed market: Heavy and ship plates.

German businessmen expect the home building boom to last two to three more years. The annual rate is 500,000 to 600,000 homes. Rapid freeing of rent controls is encouraging the modernization of older homes and boosting the outlook for electric and gas appliances.

Export trade is expected to hit $10 billion this year. An export surplus of $1.5 billion is anticipated.

Imported Steel . . .

Imported Steel, Page 123

Although few steel consumers will admit buying foreign material, nearly all say they have received price lists. Many say if it becomes necessary to buy imported products to keep operating they will "consider" doing so.

Tonnages held by suppliers of foreign steel are concentrated in the Southwest and Southeast, particularly in Florida. Substantial tonnages are also available along the Pacific Coast and in the East. Japanese steel reached southern ports for the first time this month.

Foreign produced structurals and plates from Europe and Japan are being offered service centers in Birmingham to add to bars and wire that have been plentiful from European mills for some time.

Cognizance is being taken of the strike in the form of an advance of $7 to $10 a ton on foreign steel offerings in the Birmingham area. Most products still can be delivered at plants there at prices $15 to $20 a ton below domestic mill prices.

Foreign steel is arriving at Houston at the rate of about 15,000 tons a week. That steel was ordered before the national strike began and

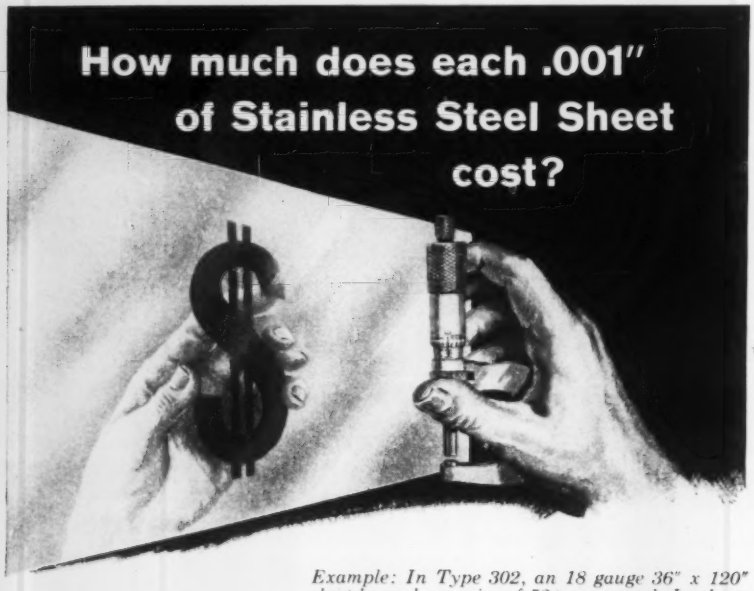
for the most part would not have been subject to cancellation if there had been no production stoppage in this country. No major price increases for foreign steel have been posted in Houston since two weeks after the strike began.

Tin Plate . . .

Tin Plate Prices, Page 119

It took 822,592 tons of steel and tin to produce the record 8.45 billion cans used last year by the U. S. brewing industry, reports the United States Brewers Foundation, New York. Can production for that industry in 1958 was 298 million units greater than in 1957. The 820,840 tons of steel needed last year was nearly 29,000 tons more than in 1956.

Brewers spent $308 million for metal cans last year. The industry is second only to fruit and vegetable canners as a customer of metal container manufacturers.



Example: In Type 302, an 18 gauge 36" x 120" sheet has a base price of 52¢ per pound. In sheets of this size, each .001" of thickness weighs 1.26 pounds per sheet. Thus, each .001" of unnecessary thickness costs you at least 65.5¢ more per sheet.

On the surface this may seem insignificant, but it has a marked effect on the total price you pay for a given quantity of stainless steel sheet. With cost a factor, this can be important since stainless steel is purchased by weight.

Using the above example, a mere .001" of unnecessary thickness costs you $20.76 more per ton. If you figure the maximum allowable gauge thickness variation of plus or minus (10%), you can readily see that the price you pay for overall sheet thickness could involve much needless cost.

Washington Steel has the equipment and the experience to produce MICRO-ROLD stainless steel to tolerances much closer than standard industry tolerances. Usually money can be saved by first selecting the minimum gauge that will serve the requirements of the application, and then specifying that the thickness be rolled to the light side of the gauge range. This specification involves no cost extra and is standard practice at Washington Steel. (If exact close tolerances must be guaranteed, there is a nominal additional charge.)

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Washington Steel Corporation

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Tubular Good . . .

Tubular Goods Prices, Page 121

Even if the strike lasts another month, it's unlikely that users' inventories of oil country goods will be seriously depleted. Stocks are heavy from an over-all tonnage standpoint, but they're not as well balanced as they might be. Small size tubing and casing are in tight supply. If the strike lasts beyond Sept. 15, some producers won't be able to accept any more orders for the balance of the year. No shipments will be made until 30 or 45 days after operations are resumed.

Hughes Tool Co.'s survey for the week ended Aug. 10 showed 2160 rigs at work, a gain of 51 from the previous week and 244 higher than for the comparable period a year ago.

Southern California Gas Co. will use a considerable part of $30 million financing for new construction, including part of a 34 in. pipeline to bring out-of-state gas to Los Angeles.

Steelmakers in the Pittsburgh area are surprised that distributors aren't showing more foresight. Says one: "Even though their stocks are dropping rapidly, they're making no effort to get on our books. If they don't put their orders in now, they'll have a long wait."

Since a large amount of steel was in transit when the strike began, deliveries from Pittsburgh to down-river terminals weren't cut off so abruptly. Inventories of most items are adequate, but spot shortages in small diameter tubing are developing. If the strike ended tomorrow, it would take a month's production to rebuild terminal inventories to levels that are considered normal for this period. Steelmakers fear that their outlets in Kansas City will be understocked during the winter if the strike doesn't end soon. They won't be able to ship to that city by barge after Oct. 15.

Demand for standard pipe remains sluggish. Orders are being entered for early shipment after the strike. Most distributors bought a substantial part of their third quarter tonnage by July 15, and current bookings are not more than 30 per cent of normal. Such orders are being entered, but without delivery promise.

When production is resumed, mill

stocks of seamless and other pipe will be low. They were depleted to fill heavy jobber demand before the start of the strike.

Although secondary prices are somewhat erratic, they are slightly firmer in some districts, including Boston.

Central Foundry Co., Holt, Ala., has added a second shift of 175 men at its soil pipe fitting and centrifugal pipe production department, J. J. Nolen, president, says. Plans are underway to increase production in other departments.

Plates . . .

Plate Prices, Page 117

Plate fabricators are still in fairly comfortable position. That is particularly true of the major consumers.

Structural fabricators need orders for additional plain material, including plates. Shipyards are under no pressure as little new work has developed and inventories are good. Carbuilders were fairly well protected on supplies when the steel strike began and they have had relatively little new work since. Heavy industrial equipment demand still lags, although more oil and chemical work is in prospect, as reflected in some improvement in demand for alloy and clad plates. The average storage tank shop is certainly not distressed at the moment because of lack of steel.

In Seattle, plate fabricators anticipate a brisk period as soon as the strike is over and a regular supply of materials is available. Several sizable jobs requiring plates are pending.

Steel Bars . . .

Bar Prices, Page 117

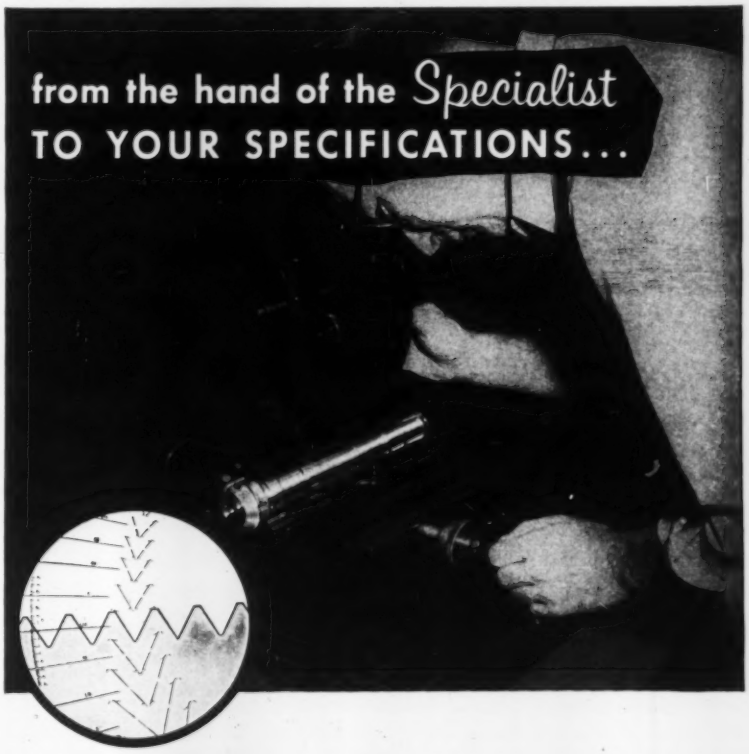
Bars in coils up to 2100 lb, among the heaviest produced in the industry, will be available for the first time at Gary Steel Works, U. S. Steel Corp., Gary, Ind., with the modernization of the 10 in. No. 4 bar mill. Contracts for equipment have been let, says T. W. Hunter, general superintendent. The modernized mill will consist of 16 stands and roll at a design speed of more than 2000 fpm. Completion is scheduled for the third quarter of 1960.

The mill has been rolling carbon bar flats, automotive alloy spring steel flats, and carbon concrete reinforcing bars. The new product line will be expanded to include rounds, squares, and hexagons in sizes $\frac{3}{8}$ in. to $1\frac{1}{2}$ in. The program will result in a new source of supply to meet the growing demands of the fastener, cold finished bar, automotive, and many other industries for bars in large coils.

While most bar consumers are still well supplied with steel, gaps in their inventories are beginning to appear—especially small consumers that had only modest tonnages in stock before the strike.

Cold finished bar consumers are particularly worried about their inventories. One company in Connecticut was so desperate last week it phoned a strike-free midwestern mill to find out how soon a 1 ton order could be shipped.

Carpenter Steel of New England is operating its second electric furnace, doubling production at Bridgeport, Conn. Its contract with the union has been extended indefinite-



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ly. With three cold finished converters operating, demand for small sizes will be partially met for some weeks. Three integrated producers of cold drawn bars are closed in New England, and one converter is low on hot rolled reserves.

Although cold drawers are booking tonnage for October and November, they won't be able to ship anything requiring new steel before the end of the year.

The supply of leaded steel bars will be short for some weeks, even after mills producing that grade are back in operation.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 118 & 119

Strikebound steelmakers are trying to discourage fourth quarter bookings. Sales offices are accepting orders from customers with the understanding that they won't be entered on mill books until the strike ends and production schedules can be set up. Backlogs are so large that most mills couldn't ship anything they booked today until December, even if they resumed production immediately.

For the most part, customers seem confident that their inventories will outlast the strike. Tightest products now are galvanized and cold rolled sheets and light plates. Few will have serious trouble before the end of September. If they call suppliers, it's only to ask how soon they can expect shipments after operations are resumed—it depends on how much processing had been completed before the shutdown. Material in warehouses can be shipped in days.

The heavy prestrike commitments plus orders and inquiries received since the strike began do not necessarily mean that mills will be operating at capacity over the remainder of the year. Time will be required for a return to peak operations after the strike. This could cut sharply into production for two or three weeks.

There are also matters of product mix, equipment repairs, and even yearend holiday influences which tend to restrict production.

Acme Steel Co., Chicago, has a contract for 685 tons of steel stripping for the Navy. The order was placed by General Stores Supply Depot, Philadelphia.

General Stores Supply Office,

Navy, Philadelphia, closes Aug. 24 on 425 tons of cold rolled, carbon sheets.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 123

Japanese steel mills have purchased 110,000 tons of Canadian coking coal which will be supplied by Coleman Collieries' Vicary Creek Mine, Coleman, Alta. The initial shipment has been loaded in Seattle and the balance is expected to be forwarded by yearend.

Pig Iron . . .

Pig Iron Prices, Page 122

Labor disturbances are beginning to haunt some of the larger foundries. A few have been forced down recently by strikes. Others are threatened.

The labor situation is retarding the movement of pig iron. However, more iron likely will be shipped this month than in July and definitely more than in the corresponding period a year ago, when the recession was at its worst.

Meanwhile, supply of merchant iron is ample despite the effect of the steel strike on various operations. Some furnaces continue in production, and some that are not in production have iron piled at general distribution points for servicing consumers.

Available supplies have been augmented by substantial tonnages of foreign ore, much of which is piled along the Eastern Seaboard. During July alone, 26,659 tons were unloaded at Philadelphia. Arrivals comprised five shipments: 11,896 tons of basic from South Africa, 5500 tons of special iron from Canada, 4400 tons of foundry iron from Finland, 4000 tons of foundry iron from Antwerp (believed to have originated in West Germany), and 863 tons of foundry iron from Holland. The South African iron is said to be for Phoenix Steel Corp. against a 60,000 ton contract. That company some time back also placed orders for 30,000 tons of Spanish iron.

A growing shortage of cast scrap is expected to provide a stronger demand for merchant iron during the remainder of the year. Dealers report that cast scrap is harder to

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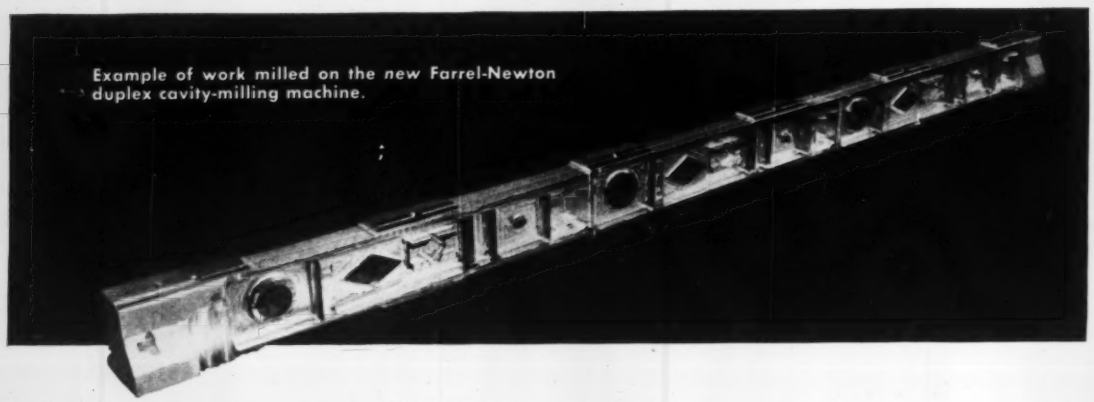

Example of work milled on the *new* Farrel-Newton duplex cavity-milling machine.

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The above illustration shows an aluminum forging which was milled on the *new* Farrel-Newton duplex cavity-milling machine. The intricate pattern of squares, diamonds and circles was automatically cut on opposite sides of the forging, *simultaneously*, under General Electric three-dimensional magnetic-tape control.

Accuracy of the work was held within tolerances of plus or minus .0005" to .002", depending on the travel rate. As both sides were milled concurrently, normal time required for work of this nature was halved.

FERROUS OR NONFERROUS—The Farrel-Newton cavity miller is the first machine of its type designed to mill ferrous as well as nonferrous metals. It has the necessary weight and rigidity to mill high-alloy steels at slow feeds and speeds. Each spindle is driven by a 60-hp adjustable-speed direct-current motor which, in conjunction with four mechanical changes, gives a cutting-speed range of 15 to 3600 rpm. This assures an optimum speed for milling iron, steel, or any nonferrous metal.

DUPLEX OR OPENSIDE—The duplex design of the machine has a number of advantages. In addition to important reductions in the time required for setup, milling and handling the workpiece, it has been found that there is much less distortion of the forging when both sides are milled simultaneously.

However, as each side of the machine is individually tape controlled, either milling unit can be supplied separately as an openside machine. If a duplex machine is required at a later date, the base, column and milling head for the second side can be added.

Because the column and milling-head units are fed, and the work is stationary, either duplex or openside machines can be furnished with any feed length. Also, a machine already installed can be easily and economically extended to meet increased work-length requirements.

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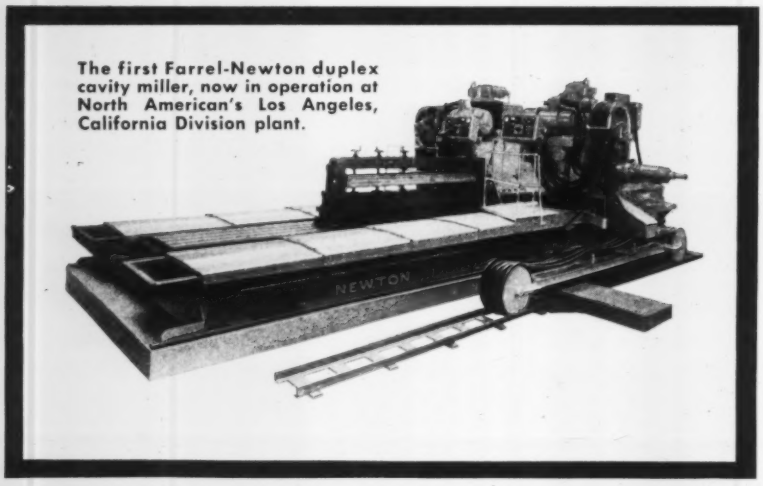

The first Farrel-Newton duplex cavity miller, now in operation at North American's Los Angeles, California Division plant.

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find, pointing to the rising market in face of the steel strike.

As foundries are able to secure less scrap, they will have to increase the use of merchant iron in their melts. This should be reflected in improved iron demand during the final four months of the year.

Distributors . . .

Prices, Page 122

Steel service centers will be more active this month than in July. Should the strike continue well into September, the increase in bookings will accelerate. Part of the gain will arise from the reduction in stocks held by consumers, the reopening of many plants following vacation shutdowns, and the usual seasonal pickup in metalworking business.

Despite the general improvement in business, legitimate service centers in some districts are concerned by the activity of what they call "grayish" operators. Those distributors have loaded up with foreign steel and can afford to offer it at prices below the schedules published by the established firms.

A survey by the American Steel Warehouse Association Inc., Cleveland, shows that tight supply applies to only three items: Galvanized sheets, cold rolled sheets, and light plates. Robert G. Welch, executive vice president, points out that service centers had an inventory of 3,700,000 tons of steel products July 15 and 3,300,000 tons Aug. 15. Those inventories are expected to decline 150,000 to 200,000 tons a week.

"Under the present conditions," Mr. Welch adds, "service centers exercise close control of their sales patterns to assure their regular customers the best possible service, and the present rate of shipments is not expected to increase by any substantial amount."

Rails, Cars . . .

Track Material Prices, Page 120

Railroad carbuilders will be hurting unless the strike is settled soon. The carriers continue to place orders for new cars, but it is pointed out that the builders in many cases had anticipated those contracts and acquired steel inventories. At least one carbuilder canceled some steel because the award expected went to another builder.

Youngstown Steel Door Co., Youngstown, is enjoying a rush of business as a result of the railroad car shortage. The firm has boosted employment to about 800 from a low point of about 125.

Bulk of recent orders has been placed by western lines which are not so hard hit by the steel strike. The firm has about 35 days' steel supply, but suspended Aug. 16 for two weeks for vacation.

The Bessemer, Ala., plant of Pullman - Standard Div., Pullman Inc., Chicago, has received orders from two railroads for a total of $2.1 million worth of spare parts for freight cars. Parts manufacturing facilities were installed early this year in the plant which previously turned out only freight cars. The Louisville & Nashville Railroad placed an order for $1.5 million for parts for 738 cars; the Seaboard Air Line Railroad, for $600,000 worth of spare parts to convert 200 hopper cars to wood chip cars.

A $3,320,000 deal for the purchase of 400 hopper cars by New York Central from Despatch Shops Inc., East Rochester, N. Y., has been approved by the Public Service Commission. Delivery of the cars, costing $8300 each, will begin at once.

Canada . . .

Effects of the steel strike in the U. S. are starting to show up in Canada. Some steel items, including large structurals and plates which have to be imported, have been sold out by suppliers. Other sizes may run out in about a month.

There are no reports of construction jobs underway being delayed. A prolonged strike, however, will delay newly started construction projects, requiring the builders to wait in line for poststrike steel supplies. One Montreal firm reports it has enough structural steel to last until February.

Canadian mills likely will try to fill their customers' needs rather than accept orders from consumers in the U. S.

There are reports that British firms, after providing as much steel as possible in recent weeks, can make no further deliveries for some months. European and Japanese steelmakers are reportedly holding off entering any long term supply contracts.

Iron ore shipments to Steel Co. of Canada Ltd., Hamilton, Ont., from the Mesabi range in Wisconsin have stopped. The mines have not been operating since the strike began, but ships continued for a time loading from supplies stored on Lake Superior docks. Now the docks are empty.

H. G. Hilton, chairman of Stelco, says the company's steelmaking operations will not be interrupted "now or next winter because of a lack of iron ore."

For the week ended Aug. 8, Canadian ingot production was 98,022 tons (80.7 per cent of capacity) against 101,364 tons (83.5 per cent) in the preceding week. July production amounted to 470,963 tons, a jump of 30.9 per cent over the 359,543 tons for the same month a year ago. For the first seven months, production totaled 3,246,930 tons compared with 2,686,883 tons for the like period of last year.

For the first seven months, pig iron output totaled 2,735,617 tons, a gain of 44.9 per cent over the 1,886,783 tons produced in the like period of 1958.

Iron Ore . . .

Iron Ore Prices, Page 123

Iron Ore Co. of Canada Ltd. plans to spend $75 million next year on the installation of an iron ore processing plant in the Carol Lake region of Labrador. The plant will process up to 6 million tons of iron ore concentrates a year. The concentrates will run about 70 per cent iron and will be mixed with Knob Lake ore to upgrade the latter. Knob Lake ore analyzes up to 63 per cent iron and, unlike the Carol Lake ore, is shipped to world markets without processing.

Wabush Iron Ore Co. has decided to speed operations in the Wabush Lake area and is proceeding with the construction of a pilot plant for treating iron ore.

Semifinished Steel . . .

Semifinished Prices, Page 117

First steel was melted July 30 in one of the two newly installed electric furnaces at Calumet Steel Div., Borg-Warner Corp., Chicago Heights, Ill. Production is continuing on a one shift basis. The second furnace will be ready in

about a month, making the combined capacity 120,000 tons annually.

The furnaces were transferred from Borg-Warner's Ingersoll Steel Products Div., Chicago, where they had been installed in 1952 but operated only briefly.

The company, formerly a producer of rerolled rail and axle steel products, will add billet steel products to its line. The company's expanded merchant mill facilities are in the final stages of completion.

Strike Cuts Steel Output To Three Year Low

Because of the strike, steel production fell to 5,233,000 net tons of ingots and steel for castings during July, the American Iron & Steel Institute, New York, says in a preliminary report. That compares with 10,907,634 tons in June and 6,442,405 tons in July of last year.

Last month's output was the smallest since July, 1956, when an industry-wide strike cut production to only 1,622,163 tons. The all-time high was recorded in May of this year at 11,600,581 tons.

Output in the first seven months of 1959 was 69,511,203 tons compared with 44,172,892 tons in the like period a year ago.

The institute's index of steelmaking shows July, 1959, output was 73.6 in terms of average production during the 1947-49 period. That compares with 158.4 during June, 1959, and 90.3 during July, 1958. The index figure for the first seven months of this year is 142.9 compared with 90.8 during the same part of last year.

The steelmaking facilities were utilized at an average of 41.7 per cent of rated capacity during July compared with 89.9 per cent in June. The rate was 81.1 per cent for the first seven months of this year.

Steel Ingot Production—July, 1959

Period	OPEN HEARTH (Net tons)	BESSEMER (Net tons)	OXYGEN PROCESS (Net tons)	ELECTRIC (Net tons)	TOTAL (Net tons)	Per cent of capacity
1959						
January ...	8,280,985	120,005	186,820	729,575	9,317,385	74.3
February ..	8,541,031	128,515	176,970	756,422	9,602,938	84.8
March	10,216,474	184,892	236,595	929,784	11,567,745	92.3
1st. Qtr. ..	27,038,490	433,412	600,385	2,415,781	30,488,068	83.8
April	9,884,322	195,730	237,018	964,850	11,281,920	93.0
May	10,117,968	200,887	257,325	1,024,401	11,600,581	92.5
*June	9,521,053	185,794	259,731	941,056	10,907,634	89.9
*2nd Qtr. ..	29,523,343	582,411	754,074	2,930,307	33,790,135	91.8
*1st 6 Mo..	56,561,833	1,015,823	1,354,459	5,346,088	64,278,203	87.8
†July	4,540,000	66,000	94,000	533,000	5,233,000	41.7

Period	—OPEN HEARTH— Net tons	Per cent of capacity	——BESSEMER—— Net tons	Per cent of capacity	——ELECTRIC—— Net tons	Per cent of capacity	——TOTAL—— Net tons	Per cent of capacity
1958								
January ..	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,912	56.5
February .	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr. ..	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,378,942	63.4	88,125	26.6	660,413	55.8	7,127,480	61.6
2nd Qtr. ..	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo...	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1
July	5,712,587	55.0	114,218	33.4	615,600	50.4	6,442,405	53.9
August ...	6,481,185	62.4	134,435	39.3	692,383	56.6	7,308,003	61.1
September..	6,769,660	67.3	103,194	31.2	759,518	64.2	7,632,372	66.0
3rd Qtr. ..	18,963,432	61.5	351,847	34.7	2,067,501	57.0	21,382,780	60.3
9 Mo.	52,756,296	57.7	985,023	32.7	5,393,948	50.1	59,135,267	56.2
October ...	7,795,541	75.0	148,458	43.4	895,779	73.3	8,839,778	74.0
November..	7,572,555	75.3	145,867	44.1	850 896	71.9	8,596,318	74.1
December .	7,755,002	74.6	116,637	34.1	838,883	68.6	8,710,522	72.9
4th Qtr. ..	23,123,098	75.0	410,962	40.5	2,585,558	71.3	26,119,618	73.6
2nd 6 Mo..	42,086,530	68.3	762,809	37.6	4,653,059	64.1	47,502,398	67.0
Total	75,879,394	62.0	1,395,985	34.7	7,979,506	55.4	85,254,885	60.6

Note—The percentages are based on annual capacities as of Jan. 1, 1959: Open hearth, 126,528,380 net tons; bessemer, 3,577,000 net tons; basic oxygen process, 4,033,160 net tons; electric and crucible, 13,495,130 net tons. Total: 147,633,670 net tons. In 1958, the capacity tonnages were: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric and crucible, 14,393,740 net tons. Total: 140,742,570 net tons.
*Revised. †Preliminary.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

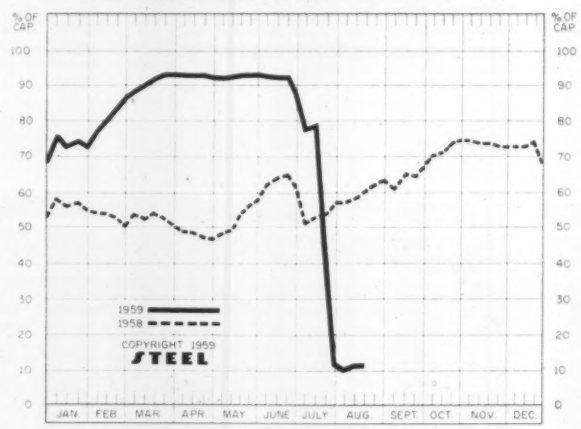
	Week Ended Aug. 23	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	0*	53	81.5
Chicago	5	— 0.5	74	86.5
Eastern	10	0	61	88
Youngstown	9	0	49	79
Wheeling	50.5	— 1.5	80	85
Cleveland	6	0	54	89.5
Buffalo	4	0	47	95
Birmingham	9	0	52	85.5
Cincinnati	60	0*	75.5	85
St. Louis	59	+ 2	77	79.5
Detroit	22	— 2.5*	69	84
Western	8	0	71	97
National Rate ..	12	+ 0.2*	61	82

INGOT PRODUCTION

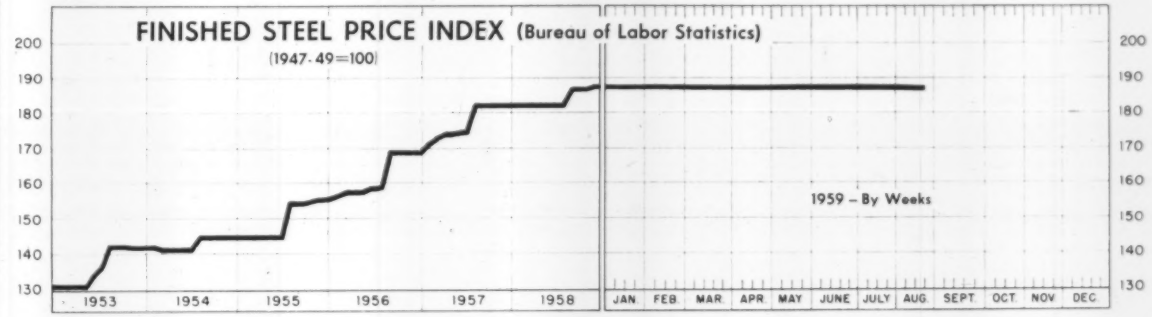
	Week Ended Aug. 23	Week Ago	Month Ago	Year Ago
INDEX ..... (1947-49=100)	21.2†	20.9	22.7	105.2
NET TONS .... (In thousands)	340†	335	365	1,690

*Change from preceding week's revised rate. †Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Aug. 18, 1959	Week Ago	Month Ago	Aug. Index	Year Ago
186.7	186.7	186.7	186.7	186.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 18

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.722
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 19 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	246.65	194.19
Index in cents per lb	6.713	6.713	6.713	6.682	5.261

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.28	$117.77
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	38.33	38.33	38.67	41.33	29.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Aug. 19 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, 7/32-5/8" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton	Aug. 19 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	49.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	50.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

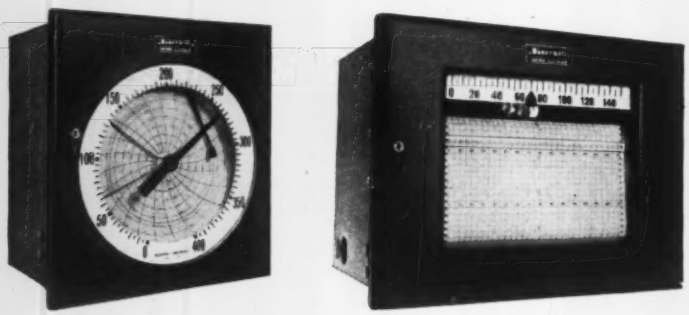
†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$38.50	$38.50	$39.50	$42.50	$29.50
No. 1 Heavy Melt, E. Pa.	40.00	40.00	40.00	38.00	27.50
No. 1 Heavy Melt, Chicago	36.50	36.50	36.50	43.50	30.00
No. 1 Heavy Melt, Valley	41.50	41.50	41.50	43.50	30.50
No. 1 Heavy Melt, Cleve.	38.50	38.50	38.50	40.00	28.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	34.50	26.50
Rails, Rerolling, Chicago	61.50	59.50	59.50	64.50	44.50
No. 1 Cast, Chicago	53.50	53.50	52.50	45.50	35.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

New Constant Voltage Unit makes *ElectroniK* instruments better than ever

by eliminating these problems



All new Precision Line *ElectroniK* circular and strip chart instruments have the new Honeywell Constant Voltage Unit that accurately regulates d-c reference supply to the measuring circuit. No more batteries, standard cells or standardizing mechanisms . . . and no more of the problems they pose.

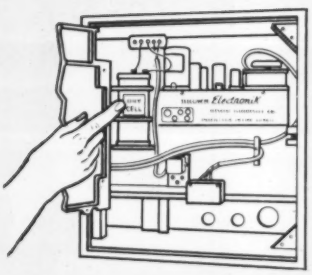
The Constant Voltage Unit delivers a constant, rectified voltage from line supply. It uses dependable Zener diodes and a reliable ambient temperature compensator.

This latest improvement in *ElectroniK* instruments assures even greater dependability, and less maintenance, and is still another reason why *ElectroniK* instruments are your best value in measurement and control. Get full details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

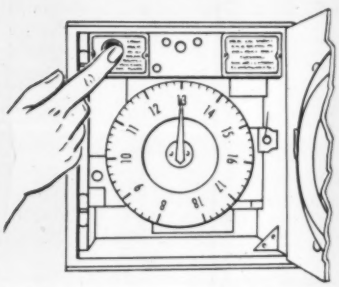
MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

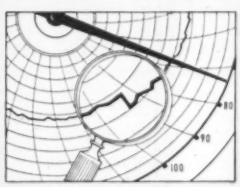
First in Control



No batteries **to replace . . . no recording or control deviation due to low battery voltage.**



No button **to push on the instrument for standardization . . . no false readings because of failure to standardize.**



No blanks or shifts **in the instrument's response to variables. You get complete continuity of recording and control.**

Steel Prices

Mill prices as reported to STEEL, Aug. 19, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 118; footnotes, page 120.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer, Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton, Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa, B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W16 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary, Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown (27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown, Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa. (9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta (9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles Calif. P1 ..... 6.375
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle A24, B3 N14 ..... 6.425
S.Ch'e'go(9)R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.,Calif.(9)B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse Mich. G5 ..... 8.30
FairfieldAla. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity, Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..... 11.75*

Alloy
Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark, Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. B5 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.75
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..... 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa.M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. B5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N. Y. B12 ..6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt., Md. B2 ..7.33
St. Paul U8 .....8.17
Williamsport Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts (3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 .....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken Pa. A3 ..5.15
Detroit (8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ..5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill.U5, W14 ..5.10
SparrowsPoint,Md. B2..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5 Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 ....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875†
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler Pa. A10 (type 1) 9.525
Bulter,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 ....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind Harbor,Ind. I-2 ...8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel ofN.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laghlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Champan&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S &W Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am.Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div. Colo Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ...5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2 5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 ....5.10
S.SanFrancisco(25) B3 .5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor Ind. Y1 ....8.40
KansasCity,Mo. S5 .....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 .....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 .7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3..8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20 ..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. W10 .7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10..7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5 .7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6..7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11 05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport Pa. E10 ..7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5..7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1..7.425*

*Plus galvanizing extras.

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11 70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10‡

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15 70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19 70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20 20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.00
Atlanta A1 .....8.00
Bartonville,Ill. K4 ....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 ....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 ....8.00
Rankin Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ...8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johntown,Pa. B2 .....13.40
KansasCity,Mo. U3 ..12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 .....13.70
Pittsburg Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling N.J. R5 .....12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3..10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ..10.05
Palmer,Mass. W12 .....10.05
Pittsburg.Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 ....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ...9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8..16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown Pa. B2 .....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. MS	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. MS	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. MS	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. MS	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. MS	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. MS	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. MS	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. MS	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. MS	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. MS	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. MS	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. MS	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. MS	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. MS	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. MS	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	196**
Kokomo,Ind. C16	195††
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. MS	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. MS	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville MS	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville MS	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville MS	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville Fla. MS	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70‡‡
Struthers,O. Y1	9.00	9.65†
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts

(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel; heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
⅞ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
⅞ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

¾ in. and smaller	35.0
⅞, 1 in. and 1 in.	16.0

Longer than 6 in.:

⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+1½0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mills bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c or cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown B2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$35.85	$42.50

*Deoxidized. Production points: Stainless-clad ssheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding Monaca,Pa., deld.	....	68.26	68.26	69.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. K2	89.00
Keokuk,Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood Tenn. T3 (Phos. 0.035% max)	73.00
Troy N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.42	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa. $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon, Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 5/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill Products (Per Base Box; 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, 400 keg min. (per keg)	$8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10‡
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16 plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.30-49.50†
Bronze, 5000-lb lots	50.50-54.60†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	51.50-56.00†
Phosphor-Copper, 5000-lb lots	62.80
Copper (atomized) 5000-lb lots	43.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
Chromium, electrolytic 99.8% Cr. min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scrafing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.03	$6.03	$5.98	$5.88	$6.34
Bar Size Angles	6.03	6.03	5.98	5.88	6.34
Structural Angles	5.93	5.93	5.88	5.78	6.18
I-Beams	5.93	5.93	5.88	5.78	6.18
Channels	5.93	5.93	5.88	5.78	6.18
Plates (basic bessemer)	5.70	5.70	5.65	5.55	5.95
Sheets, H.R.	7.00	7.00	6.95	6.85	7.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.30	9.30	9.25	9.15	9.65
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.45	9.45	9.40	9.30	9.70
Sheets, C.R. (drawing quality)	8.50	8.50	8.45	8.35	8.75
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.22	25.06	24.91	24.61	26.28
Barbed Wire (†)	7.15	7.15	7.10	7.00	7.40
Merchant Bars	6.08	6.08	6.03	5.93	6.33
Hot-Rolled Bands	6.00	6.00	5.95	5.85	6.25
Wire Rods, Thomas Commercial No. 5	6.10	6.15	6.10	6.00	6.35
Wire Rods, O.H.	6.65	6.70	6.65	6.55	6.90
Bright Common Wire Nails (‡)	7.65	7.65	7.60	7.50	7.90

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.03% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 11.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered, Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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Scrap Maintains Strong Undertone

Consensus is that No. 1 grades will not decline much below current levels until at least two months after settlement of strike. Demand for foundry grades increases

Scrap Prices, Page 128

• **Philadelphia**—Bolstered by continued strong demand for export, especially for Japan, open hearth scrap prices are firm. About five cargoes are scheduled to leave this port in August, although one may not leave until early September. Tonnage moving abroad is comprised principally of No. 1 and No. 2 heavy melting and No. 2 bundles.

Domestic demand for open hearth scrap is comprised of relatively modest orders from those mills not affected by the steel strike and from some plants which are ordering for delivery after resumption of operations.

Price change in the list is confined to a $1 increase in couplers, springs, and wheels to $46, delivered.

• **New York** — Brokers' buying prices are strong and unchanged. Most strength is derived from export demand, although demand from domestic buyers is fair. Some mills are not strikebound and are placing tonnage; others are executing firm contracts for shipment after resumption of operations.

• **Chicago**—Scrap prices are holding steady with activity practically at a standstill. Struck mills are making no effort to acquire melting material for delivery when operations are resumed.

Market bullishness noted among dealers is attributed to the belief that a long steel strike could create some stringency in iron ore supplies, causing to mills to reduce hot metal in open hearth charges.

• **Cleveland**—The local market for steelmaking grades of scrap is "dead." Only small tonnages are moving to mills still operating in Canton, Warren, and Mansfield, Ohio. Some of those mills are restricting purchases in hopes of getting material at lower prices, but brokers believe the market will remain strong for at least two months after the strike is ended.

Yards of dealers are pretty well filled, mostly with No. 2 material. The flow of industrial scrap has tapered and does not pose as serious a problem as it did earlier in the month. More calls for foundry grades are being received as activity in casting shops points upward.

• **Youngstown** — Scrapmen are busy trying to assess the possible effects of a long steel strike on their market—especially those of a strike-created iron ore shortage next winter and spring. Some executives feel that a serious ore shortage is bound to result if the strike isn't ended before Sept. 15.

An iron shortage would force mills to use more scrap. A lot of

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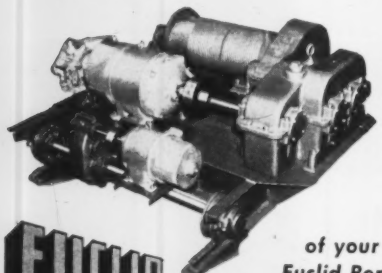
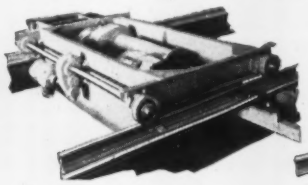
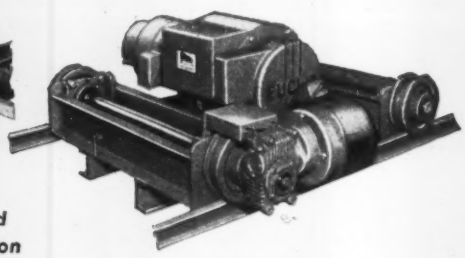


This submerged crane trolley is designed to meet the low headroom conditions which are more prevalent in existing low buildings today with the wide use of air conditioning in many industrial plants.



A Series "H" top running trolley with a worm gear drive used in double girder cranes in capacities of 3 to 15 tons.



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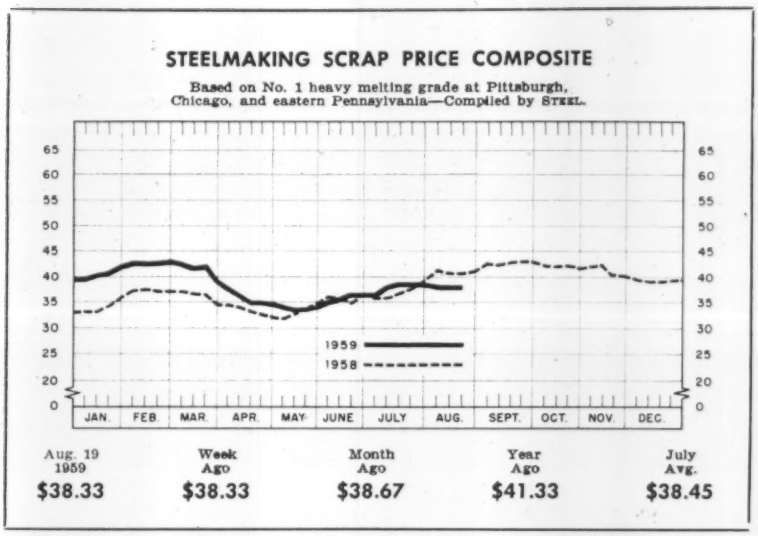


scrap continues to flow into the yards with only a relative trickle going to foundries and smaller steel firms which are operating.

• **Pittsburgh** — Prices are mixed, with some weaknesses apparent in railroad scrap and considerable strength in the cast iron grades. The Pennsylvania Railroad was surprised when several items it offered dropped less than expected.

Foundry scrap is strong because most pig iron producers are on strike. Brokers for an Ohio foundry are offering Pittsburgh dealers $47 a ton for No. 1 cupola cast and saving them freight by sending trucks to pick it up. The longer the strike lasts, the cheaper industrial scrap will become unless sellers can find some place to store it.

• **Buffalo**—Cast scrap has advanced $2 a ton as a result of brisk demand from foundries. The price of No. 1 cupola cast is $44 to $45 while No. 1 machinery cast is quoted $48 to $49. Supplies appear to be getting steadily shorter.

Mill scrap grades are holding steady although some of the out of district demand appears to have tapered off. Scrapyards here are operating at only about 50 per cent of capacity due to light receipts.

• **Los Angeles**—The movement of scrap to the docks for export continues. The market eased slightly earlier in the week, but it has picked up again. Prices on No. 1 and 2 bundles dropped as much as $2 a ton.

• **Detroit** — Small spot sales here reflect growing dealer weakness in the local market. Small lots of bundles have changed hands at $32 on track. A Canadian order for bundles at $38 on track reportedly is not being filled.

Auto lists, closing this week, are expected to reflect dealer pessimism; prices may be off $2 to $3 a ton.

• **Cincinnati** — Scrap prices are holding firm in a dull market. Brokers' buying prices continue to show a strong undertone with No. 1 heavy melting quoted $35.50-$36.50, based upon the last sale. It's doubtful that consumers could acquire much tonnage at that price.

Demand for cast grades is active, with some shipment out of district as hot iron supplies dwindle. No. 1 railroad heavy melting moved up $1 a ton at $41-$42. The almost universal optimism that scrap prices are bound to rise after the strike settlement means dealers are holding all the scrap they can in their yards.

• **Birmingham** — With only a trickle of scrap coming into district yards, some consumers are resorting to special deals, paying above the market for scarce items. Cast prices are firm, but movement is slow. The export market continues strong with prices in some areas moving up to $41 for No. 1 heavy melting, $38 for No. 2 heavy melting, and $28 for No. 2 bundles. There is no local market for No. 2 bundles.

• **Houston** — Three and one-half cargoes of scrap (37,500 tons) have been loaded or scheduled for loading here for Japan since the local mill was closed by the steel strike. Additional overseas commitments may be made. Meanwhile, some think the Lone Star mill will purchase a normal tonnage for September delivery and that Mexican mills will return to the Texas market.

• **Seattle**—Little trading is being done in the scrap market and plans are based on resumption of mill buying. Meanwhile, an ample supply of No. 2 heavy melting is being accumulated.

Scrapping of government owned tonnage will add substantially to stocks on the Pacific Coast. At Seattle, the Todd Shipyard will break up the battleship *Colorado* for the Learner Co., Oakland, Calif., which bid $611,777 for the hull. A sister ship, the *Maryland*, will be scrapped in California, and bids were opened Aug. 17 for sale of the *West Virginia* for dismantling.

Japanese steel interests are supplementing their scrap supply by the import of obsolete tonnage for scrapping in yards in Japan. A British Columbia tug company is towing several Liberty-type freighters and other outdated vessels, including a 28,000 ton Chilean battleship, from this coast to Japan.

Structural Shapes . . .

Structural Shape Prices, Page 117

Structural fabricators are complaining about a lack of jobs rather than a shortage of steel. The sharp drop in highway work because of the tie-up in federal appropriations has been the heaviest blow. Bids on many projects have been held up for a month or more; others have been postponed indefinitely.

A few bridge projects will be let soon—cases where general contracts were placed prior to the withholding of funds in Washington.

Vermont is taking estimates on composite wide flange beam bridges totaling 1510 tons. In New Eng-

(*Please turn to Page* 133)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Aug. 19, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Aug. 19	$38.33
Aug. 12	38.33
July Avg.	38.45
Aug. 1958	41.58
Aug. 1954	28.80

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	34.00-35.00
No. 1 dealer bundles	39.00-40.00
No. 2 bundles	29.00-30.00
No. 1 busheling	*41.00-42.00*
No. 1 factory bundles	47.00-48.00
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*24.00-24.00*
Cast iron borings	*23.00-24.00*
Cut structurals:	
2 ft and under	*48.00-49.00*
3 ft and under	*47.00-48.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*49.00-50.00*
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	45.00-46.00
Unstripped motor blocks	33.00-31.00
Clean auto cast	46.00-47.00
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00-46.00*
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Random rails	*54.00-55.00*
Angles, splice bars	*53.00-54.00*
Railroad specialties	*53.00-54.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	37.00-38.00
No. 1 hvy melt., dealer	35.00-36.00
No. 2 hvy melting	33.00-31.00
No. 1 factory bundles	*41.50-42.50*
No. 1 dealer bundles	37.00-38.00
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	37.00-38.00
No. 1 busheling, dealer	35.00-36.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft	48.00-49.00
Punchings & plate scrap	49.00-50.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	50.00-51.00
Unstripped motor blocks	44.00-45.00
Clean auto cast	59.00-60.00
Drop broken machinery	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
R.R. malleable	59.00-60.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Angles, splice bars	52.00-53.00
Axles	*57.00-58.00*
Rails, rerolling	*61.00-62.00*

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	110.00-115.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	41.00-42.00
No. 1 bundles	42.00-43.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos	44.00-45.00
Electric furnace bundles	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00

CLEVELAND

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	38.00-39.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Brake shoes	36.00-37.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stianless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	39.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	54.00
Charging box cast	45.00
Heavy breakable cast	44.00
Unstripped motor blocks	44.00
Clean auto cast	56.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00
Rails, 18 in. and under	50.00
Rails, random lengths	45.00
Rails, rerolling	59.00
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	38.00-39.00
No. 2 bundles	23.00-24.00
No. 1 busheling	38.00-39.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plates	44.00-45.00
Structurals & plates	43.00-44.00
Electric furnace bundles	38.00-39.00
Electric furnace:	
3 ft and under	37.00-38.00
2 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	55.00-56.00
Stove plate	55.00-56.00
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	57.00-58.00
Rails, random lengths	46.00-47.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	40.00
No. 2 heavy melting	35.00
No. 1 bundles	41.00
No. 2 bundles	27.00-28.00
No. 1 busheling	41.00
Electric furnace bundles	42.00
Mixed borings, turnings	20.00†
Short shovel turnings	24.00
Machine shop turnings	20.00
Heavy turnings	34.00
Structurals & plate	43.00-45.00
Couplers, springs, wheels	*46.00*
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	45.00
Drop broken machinery	50.00-51.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.00-29.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00†
Short shovel turnings	13.00-14.00†
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-31.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*44.00-45.00*
No. 1 machinery	*48.00-49.00*

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable cast	43.00-44.00
Charging box cast	43.00-44.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	*41.00-42.00*
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	37.00-38.00*
No. 2 heavy melting	32.00-33.00*
No. 1 bundles	34.00
No. 2 bundles	24.00-25.00*
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	43.00-44.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable	33.00
Foundry malleable	42.00-43.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-25.50
No. 1 bundles	28.00-29.00
No. 1 busheling	28.00-29.00
Machine shop turnings	8.50-9.00
Short shovel turnings	*11.50-12.00*
No. 1 cast	*37.00-38.00*
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	38.00-38.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	34.00-35.00
No. 2 bundles	21.00-22.00
No. 1 busheling	32.00-33.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	14.00-15.00

Cast Iron Grades

No. 1 cupola	46.50-47.50
Stove plate	38.00-39.00
Heavy breakable	39.00-40.00
Unstripped motor blocks	28.00-29.00
Charging box cast	39.00-40.00
Clean auto cast	50.00-51.00

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

(Delivered to docks)

No. 1 heavy melting	*38.00*
No. 2 heavy melting	*36.00*
No. 1 bundles	*37.00*
No. 2 bundles	*19.00*
Machine shop turnings	*16.00*
Shovel turnings	20.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	*47.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	46.50

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

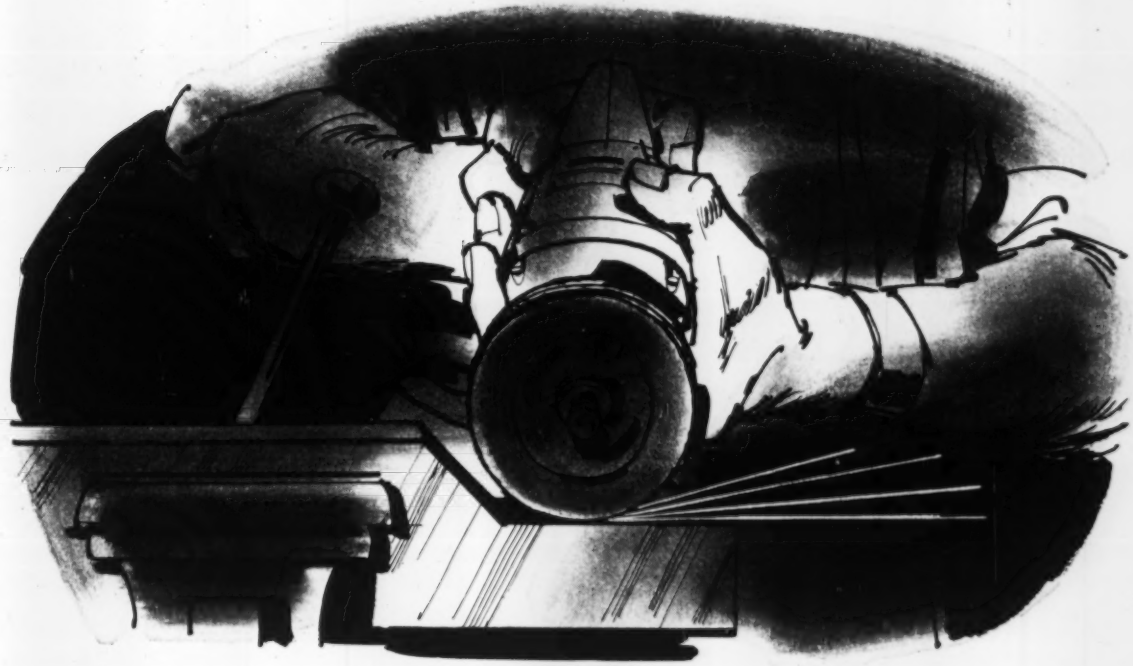
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

*Prices to shippers, f.a.s.
†Nominal.
‡F.o.b. Hamilton, Ont.

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



In diffused daylight, so that spark characteristics can be accurately observed, hold a sample against a clean grinding wheel revolving at high speed. If the material gives off only a few very short orange lines, it is probably Stellite. It is well to have a sample of known analysis for comparison.

Here is how to test for STELLITE

The original Stellite alloy was developed by Elwood Haynes, a pioneer in the metals field as well as in the automobile industry.

To meet the high temperature requirements of the jet age, and the need for improved ductility, additional alloys have since been added to the older cobalt-base Stellite group.

These alloys, because of their unusual hardness, strength and wear-resistant properties, are used for metal cutting tools, burnishing rollers, and for valve, battery machine and jet engine parts. They have many other applications.

They are also effective as a hard facing material on machinery parts which are subjected to excessive abrasive action such as trimming dies, turbine blades, agricultural and earthworking equipment. Their use may increase the service life of the section from weeks to years.

For scrap of known analysis, our personnel, equipment and strategically located facilities are specifically geared for the purchase or sale of dependably segregated metals. We welcome your inquiry.

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More Action in Capital

Keep a close eye on Congress for the next few weeks. A hopper of bills has been introduced to aid the domestic minerals industry. Lead-zinc relief seen

Nonferrous Metal Prices, Pages 132 & 133

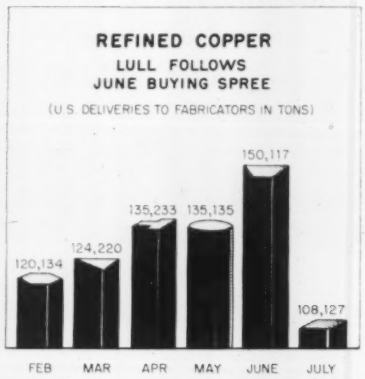
MINERALS LEGISLATION is getting a new, hard look from Congress. Bipartisan sentiment to help depressed metals, particularly lead and zinc, is growing (see STEEL, Aug. 17, p. 154). It is spurred by a vocal and statistically well prepared group of mine state congressmen.

• **Which Direction?**—Congressional pulse takers say the only questions involve what the remedial assistance will be and how effective it will be. The latest maneuver came last week. As predicted by STEEL (July 20, p. 52), Sen. Robert S. Kerr (D., Okla.) and 13 other senators sponsored a resolution directing the Tariff Commission to make a complete study of the lead and zinc industry, including an analysis of conditions and what additional import restrictions (if any) need to be imposed. Chances for passage in this session of Congress look good, say Capitol Hill observers.

The commission is collecting data on the importation of fabricated lead and zinc products. They were excluded from the system of quotas imposed by the administration last fall after the commission had recommended (by a split vote) both quotas and tariffs.

• **Another Road**—A strong Congressional segment is advocating a course that could have more wide ranging effects. Three almost identical bills in the Senate and one in the House call for the establishment of a national minerals and mining policy. Perhaps the best known is S.1537, introduced by Sen. Gordon Allott (R., Colo.). It provides for: 1. Development of an economically sound and stable domestic mining and minerals industry. 2. Development of domestic mineral reserves and resources necessary to assist satisfaction of industry and security needs. 3. Promoting the wise and sufficient use of our mineral resources through research programs.

The bill authorizes the secretary



Source: Copper Institute, Data for 1959

of the interior to carry out policy to implement the three steps. He would report to Congress annually or semiannually and make legislative recommendations.

Interior went on record earlier this month as favoring the Allott Bill. So did Commerce Secretary Frederick Mueller—but with reservations. Stung by a barrage of verbal haymakers thrown by senators, he had to backtrack from a July statement that he thought "domestic mines were not in bad shape on the whole." Secretary Mueller agreed the domestic minerals industry should be on a "sound economic basis" but intimated he's opposed to subsidies, tariffs, and quotas. Disgusted observers say you can't live up to Secretary Mueller's qualifications and do anything meaningful for lead and zinc.

• **Significance**—Any one of the four bills stands a good chance of passage before Congress adjourns, believe observers, and would put the world on notice that the U. S. plans to maintain its domestic mining interests—something new. Allott thinks this could lead to a series of formal international agreements limiting production and exports. Voluntary curtailments in production and exports in lead and zinc were agreed on by delegates at a special United Nations meeting in the spring. Spokesmen then estimated that announced intentions of producers would lower 1959's projected lead metal surplus from 168,000 tons to an annual rate of 66,080 tons in the second half and zinc's from 134,400 tons to an annual rate of 17,920 tons. It's still too early to tell if that much tonnage has been curtailed, but domestic metalmen are skeptical.

• **Most Likely:**—We'll probably see some kind of national minerals program, a series of administration moves to help domestic miners. Inclusion of fabricated lead and zinc under the protecting arm of quotas. Possible: More stringent restrictions on the importation of lead and zinc ores and metal.

NONFERROUS PRICE RECORD

	Aug. 19 Price	Last Change	Previous Price	July Avg	June Avg	Aug., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.00	Aug. 7, 1959	29.50–30.00	30.048	31.490	26.510
Lead	11.80	May 7, 1959	11.30	11.800	11.800	10.646
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.625	Aug. 19, 1959	102.50	102.298	104.284	94.995
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

This Standard Oil product made better grinding possible at Cessna

Aircraft Company's Industrial Products Division licked three problems with ARGON Oil No. 4

Situation: A fluid used in grinding operations at this Cessna plant at Hutchinson, Kansas, was creating three problems:

1) It washed the lubricant from regulator wheels and grinding fixtures, causing them to freeze.
2) It caused build-up of deposits.
3) It stripped paint from machine surfaces.

What was done: Cessna management called in a Standard Oil lubrication specialist who recommended ARGON Oil No. 4 in ratios of 100 and 150:1 for test. The coolant was tested in two centerless grinders for two months.

What happened: All three conditions which were hampering operations were cleared up when the switch was made to ARGON Oil No. 4. Cessna also found that work remained rust-free after passing through the machines, something that had not been the case before. They also found that the coolant didn't foam. With no foam, more of it stayed on the wheel, resulting in cooler operation. Faster cuts were obtained with finer wheels. All 12 grinders in the Cessna shop were then converted to ARGON Oil No. 4.

What you can do: Get more facts about ARGON Oil No. 4 from the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about **ARGON Oil No. 4**

• Clear, transparent fluid • Able to control corrosion and rust on work and machines • All chemical. Does not support bacteria growth • Unaffected by humidity • Fire resistant • Odorless

Jerry Croes, Standard Oil staff engineer, Paul Hoyer, Cessna section superintendent and Bill Ray, Standard Oil lubrication specialist (l. to r.) inspect rust-free finish after grinding with ARGON Oil No. 4 while J. E. Petrie (far left), operator, looks on. Both Jerry Croes and Bill Ray have plenty of experience in this sort of work. Jerry has been at it for 16 years. He has an engineering degree from South Dakota School of Mines & Technology and has completed the Standard Oil Sales Engineering School. Bill has six years service working with industrial customers.

You expect more from **STANDARD** *and you get it!*

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00 deld.; custom smelters, 30.00; lake, 30.00 deld.; fire refined, 29.75 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis. New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $230-232 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.625.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.895, f.o.b. Temple, Pa., or Reading Pa.; rod, bar, wire, $1.875, f.o.b. Temple, Pa.

COPPER WIRE

Bars soft, f.o.b. eastern mills, 20,000-lb lots, 35.355; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 23.25-23.75; No. 2 heavy copper and wire, 21.25-21.75; light copper, 19.25-19.75; No. 1 composition red brass, 18.00-18.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	54.13b	51.36c	....	54.32
Yellow Brass	47.24	31.81d	47.78	50.65
Low Brass, 80%	50.03	47.97	50.57	53.34
Red Brass, 85%	51.02	50.96	51.56	54.33
Com. Bronze, 90%	52.55	52.49	53.09	55.61
Manganese Bronze	55.65	49.24	59.74	....
Muntz Metal	49.95	45.26	....	....
Naval Brass	51.90	45.71	58.46	55.31
Silicon Bronze	59.23	58.42	58.77	76.89
Nickel Silver, 10%	62.85	65.17	65.17	....
Phos. Bronze	73.92	74.42	74.42	75.60

SCRAP ALLOWANCES e (Based on copper at 30.00c)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	26.000	26.000	25.250
Yellow Brass	19.625	18.750	17.750
Low Brass, 80%	22.000	21.750	21.250
Red Brass, 85%	22.875	22.625	22.125
Com. Bronze, 90%	23.875	23.625	23.125
Manganese Bronze	18.375	18.125	17.500
Muntz Metal	18.375	18.125	17.625
Naval Brass	18.250	18.000	17.500
Silicon Bronze	25.500	25.250	24.500
Nickel Silver, 10%	24.500	24.250	12.250
Phos. Bronze	27.125	26.875	25.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20 000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.50-17.00; new brass clippings, 14.75-15.25; light brass, 11.50-12.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 12.75-13.25; auto radiators, unsweated, 13.75-14.25; cocks and faucets, 14.25-14.75; brass pipe, 14.25-14.75.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.50-3.00; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-12.00; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.75-13.25; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 56.00; light scrap, 51.00; turnings and borings, 36.00.

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.50; light copper, 22.25; refinery brass (60% copper) dry copper content, 24.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.50; light copper, 22.25; No. 1 composition borings, 21.00; No. 1 composition solids, 21.50; heavy yellow brass solids, 15.50; yellow brass turnings, 14.50; radiators, 17.25.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 46.29; oval, 44.50, 5000-10,000 lb; electrodeposited, 36.00, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 6000-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 127*)

land, competition for contracts is unabated: Several large tonnages, fabricated stringer and rolled beam work, went at 12.5 and 12.75 cents a pound. They are lower than quotations on concrete bars in place for the same jobs.

While ground was broken recently for the $320 million Narrows bridge, bids on the structural steel may not be asked for some weeks, pending work on plans.

Structural fabricators in the Pittsburgh district are running out of wide flange beams and are discovering that steel service centers are in no position to help them. Users couldn't accumulate inventories for new projects before the strike because they had no idea what jobs they'd be awarded. They probably could buy what they need on the East Coast, but they'd have to pay premium prices (10 to 11 cents a pound versus 7.5 to 8 cents locally).

Contracts for construction of a $20 million mill and smelter at Kimberly, B. C., have been awarded by Consolidated Mining & Smelting Co. of Canada. Dominion Bridge Co. Ltd., Montreal, Que., will fabricate the unstated tonnage of structural steel which will be furnished by United Kingdom mills.

Structural steel fabricators in the San Francisco Bay area say they expect normal operations until about Oct. 15 and then could proceed on a reduced basis for another 30 days, based on present inventories. One large fabricator says he has a backlog of work for about two years.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5000 tons, two bridges, Chesapeake Bay tunnel project, Little Creek-Kiptopeake, Va., to American Bridge Div., U. S. Steel Corp., Pittsburgh; subject to bond sale.

1000 tons, Oregon state labor and industries building, Salem, Oreg., Pacific Coast Div., Bethlehem Steel Co., Seattle; Henry Mason, Portland, Oreg., general contractor.

1000 tons (estimated), smelter, coke plant, etc., for Consolidated Mining & Smelting Co. of Canada, Kimberly, B. C., to Dominion Bridge Co., Vancouver, B. C.

900 tons, including reinforcing bars, transistor plant, Lewiston, Maine, Raytheon Co., Boston, to Bancroft & Martin Rolling Mills Co., South Portland, Maine.

555 tons, angles, U. S. Engineer, Chicago, to Oregon Steel Mills, division of Gilmore Steel Corp., Portland, Oreg.

400 tons, Cape May Canal bridges for the State of New Jersey, through Ralph Cornell, erector, Philadelphia, to the Delaware Valley Steel Works Inc., Wilmington, Del.

365 tons, angles, U. S. Engineer, Chicago, to Phoenix Steel Corp., Phoenixville, Pa.

200 tons, pulp and paper plant, Sitka, Alaska.

IF YOU OPERATE A FURNACE . . . . .

We will purchase your scrap linings, retorts, conveyors, muffles, racks, etc. Any item made of Nickel alloy.

Write, Wire or Call

Weinstein Co.,

610 W. 8th St.
Jamestown, N. Y.
Phone 61-154

FOR SALE

Three used automatic conductor pipe machines in good condition for 3" and 4" plain round and corrugated pipe and 3" square pipe—priced right.

Write Box 785, STEEL
Penton Bldg. Cleveland 13, Ohio

WANTED

Experienced Man To Head Our Aluminum Sales Division

D. M. Stembel
LOCKHART IRON AND STEEL CO.
McKees Rocks, Pa.

CLASSIFIED

Representatives Wanted

LEADING LIFTING MAGNET MANUFACTURER WILL APPOINT EXCLUSIVE AGENTS TO SELL LIFTING MAGNETS TO SCRAP METAL TRADE. ADVISE TERRITORY COVERED, ALLIED EQUIPMENT LINES, AND NUMBER OF SALESMEN. WRITE BOX 786, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

Help Wanted

METALLURGICAL ENGINEER for high carbon wire mill. Minimum three years' experience. Work involves manufacturing processes, problems and product responsibility. Will be in direct charge of junior engineer. Address J. A. Turner, John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation, 640 So. Broad St., Trenton 2, N. J., giving age, experience, education and salary requirements.

CERAMIC ENGINEER—Research and Development; 5-10 years experience in refractories manufacturing and/or research for the refractories or steel industries. Supervisory experience preferred but not essential. Send detailed resume and salary requirements. Box 787, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14, all capitals, 25 words or less $4.50, each additional word .18; all capitals leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

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H & S

saves you time and money on

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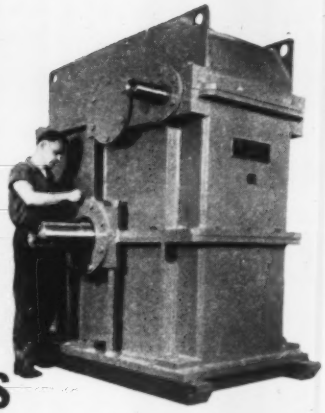
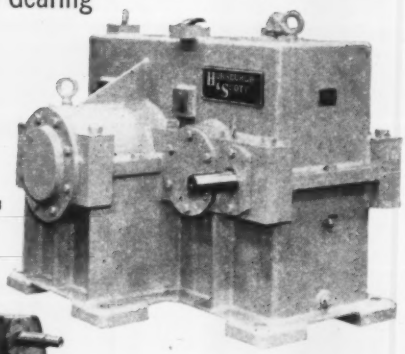
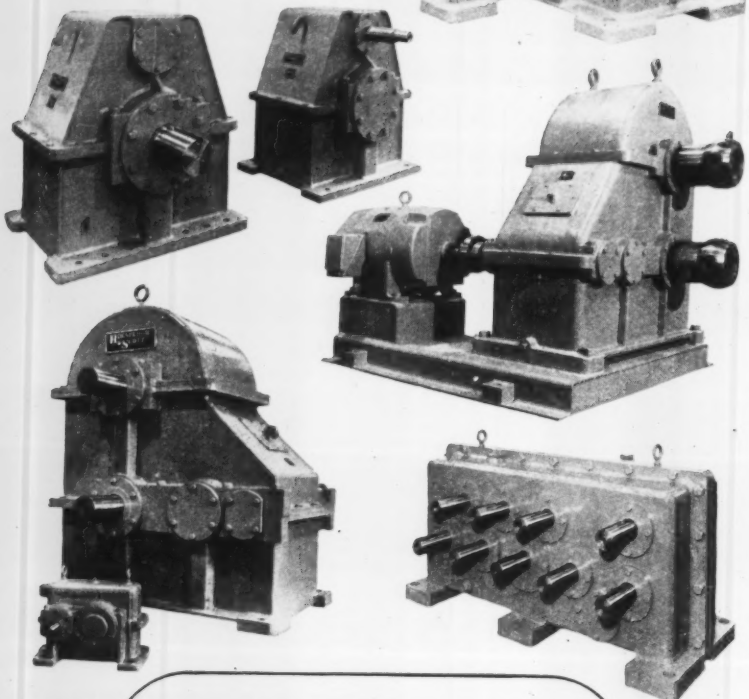
Helical · Herringbone · Worm Gearing



H & S engineers are thoroughly experienced in the design of special drives—can solve unusual drive and transmission problems at the lowest possible cost . . . in the shortest time. Can we help you? Write or call today.

For data helpful in selecting all types of speed reducers and gearing, our Catalogs 55 and 57 are available on request.





THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue • Cleveland 14, Ohio

to Pacific Car & Foundry Co., Seattle.

150 tons, Rainier pulp plant addition, Hoquiam, Wash., to Pacific Car & Foundry Co., Seattle.

100 tons or more, tower and facilities, missile test center, Patrick Air Force Base, Florida, to Kaiser Steel Corp., Los Angeles.

STRUCTURAL STEEL PENDING

1000 tons, Bomarc missile installation, Paine Air Field, Washington; John H. Sellen Construction Co., Seattle, low at $2,486,125.

1000 tons, Bomarc missile installation, Adair Air Field, Oregon; general contract to Donald M. Drake Co., Portland, Oreg., low $2,496,758.

620 tons, two, 4-span, composite wide flange beam bridges, Putney, Vt.; bids Sept. 18, Montpelier, contract 2; also 190 tons, concrete reinforcing bars.

525 tons, three, 3-span and one, 5-span composite wide flange beam bridges, Putney, Vt.; bids Sept. 11, Montpelier, contract 1; also 335 tons, reinforcing bars, and 350 tons, steel piling.

255 tons, one, 4-span, composite wide flange beam bridge, Putney, Vt.; bids Sept. 25, Montpelier, contract 3; also 70 tons, concrete reinforcing bars.

110 tons, two, wide flange beam bridges, Cavendish, Vt.; also 55 tons, concrete reinforcing bars.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1300 tons, Penn State University, State College, Pa., through Virginia Engineering Corp., to Truscon Div., Republic Steel Corp., Philadelphia.

755 tons, science building, Villanova University, Villanova, Pa., through Mason-Cullen, contractor, to American Steel Engineering Co., Philadelphia.

450 tons, apartment, Wilmington, Del., through E. J. Frankel, contractor, to American Steel Engineering Co., Philadelphia.

310 tons, Bomarc project, Paine Air Field, Washington, to Pacific Coast Div., Bethlehem Steel Co.; John H. Sellen Construction Co., Seattle, general contractor.

255 tons, Washington state overcrossing, King County, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Dale M. Madden, Seattle, general contractor.

218 tons, highway railroad overcrossing, Helena, Mont., to Pacific Coast Div., Bethlehem Steel Co., Seattle; Sletten Construction Co., general contractor.

195 tons, Eielson Air Base, housing project, Alaska, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Alcan-Pacific Construction Co., general contractor.

135 tons, Foodland shop, Seattle, to Pacific Coast Div., Bethlehem Steel Co., Seattle; Teufel Construction Co., Seattle, general contractor.

130 tons, marine terminal, Wilmington, Del., through Taylor-Davis, that city.

REINFORCING BARS PENDING

33,000 tons, Wanapum Dam, Ephrata, Wash.; general contract to Grant County Constructors, awarded Schedule B, at $93,277,690, by Grant County Public Utility Department.

300 tons, Bomarc installation, Adair Air Field, Oregon; Donald M. Drake Co., Portland, Oreg., general contractor.

PLATES . . .

PLATES PLACED

135 tons, stainless (76 tons sheets), General Stores Supply, Navy, Philadelphia, to Eastern Stainless Steel Corp., Baltimore; 100 tons, sheets, Ingersoll Steel Div., Borg-Warner Corp., Chicago.

PLATES PENDING

500 tons, penstock, etc., for municipal powerplant, Sitka, Alaska; bids Sept. 1; Carey & Kramer, Seattle, engineers.

290 tons, 2.5 million gallon water tank, King County, District No. 75, Seattle; Pittsburgh-Des Moines Steel Co., Seattle, low $116,993.

250 tons, carbon, General Stores Supply, Navy, Philadelphia; bids Sept. 10.

200 tons, fuel tanks, two Bomarc installations in Washington and Idaho; general contracts awarded.

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"Samson" Shot (chilled iron)
"Angular" Grit
ANGULAR GRIT

AMERICA'S LEADING METAL ABRASIVES

The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.

PITTSBURGH CRUSHED STEEL CO.
Arsenal Sta., Pittsburgh 1, Pa.

MALLEABRASIVE
MALLEABLIZED SHOT and GRIT

SSP TRU-STEEL SHOT
TRU-STEEL HIGH CARBON STEEL SHOT

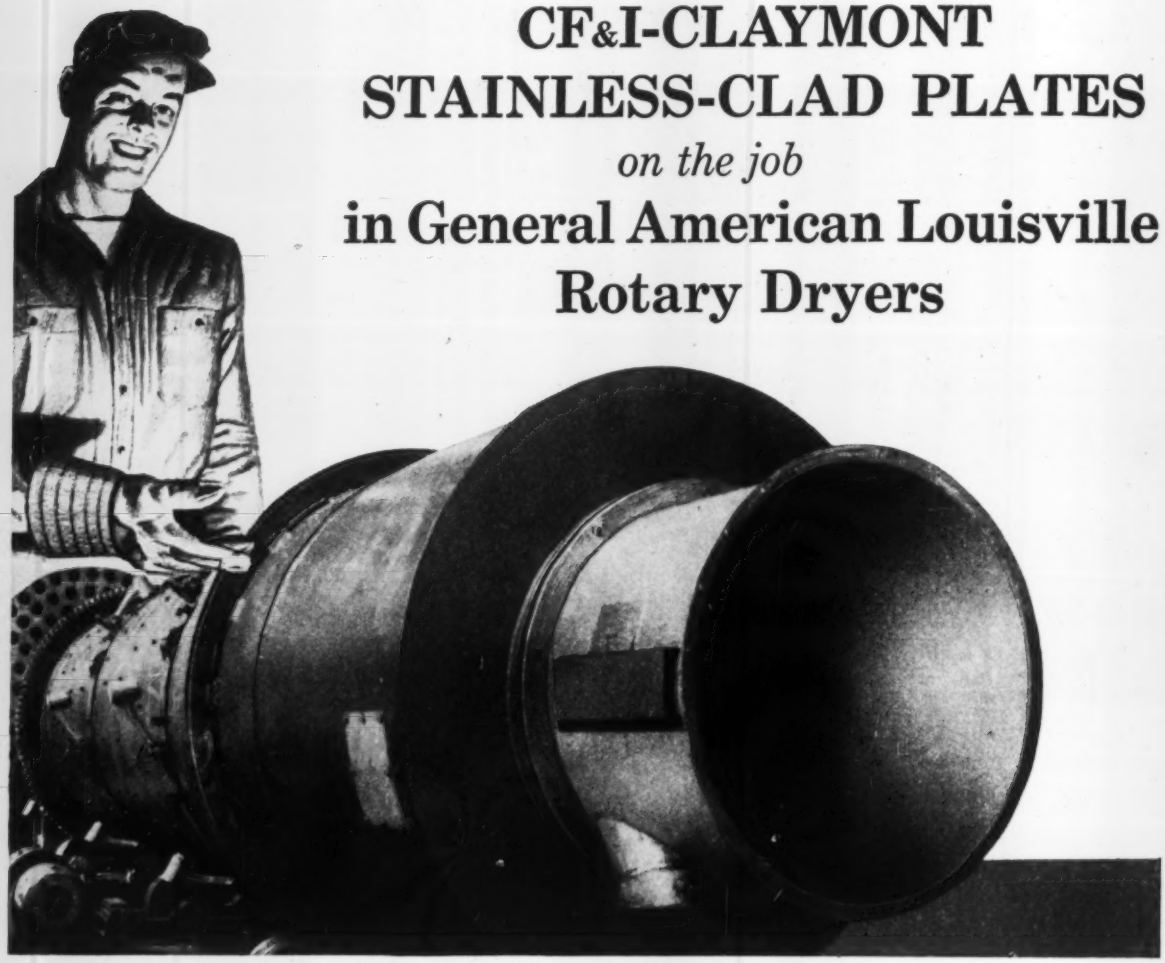
man conquers mountains

And, some day, man will also conquer cancer. With your help.

Guard your family . . . fight cancer with a checkup and a check

AMERICAN CANCER SOCIETY

CF&I-CLAYMONT STAINLESS-CLAD PLATES *on the job* in General American Louisville Rotary Dryers



This warm air dryer, built by the Louisville Dryer Division of General American Transportation Corporation, was fabricated from Claymont Stainless-Clad Steel Plates. The plates consist of a ¼" thick cladding of type 304 stainless, bonded to a 1" plate of flange-quality carbon steel.

The Image of CF&I reflects *customer satisfaction*. For instance, here's what one steel plate user says about a CF&I product made to meet his company's requirements:

"By using Claymont Stainless-Clad Steel Plate, we get the same protection afforded by stainless steel, plus the economies of carbon steel."

This statement was made by Mr. C. F. Spencer, sales engineer for the Louisville Dryer Division of General American Transportation Corporation. He goes on to say, "When dryer specifications require the elimination of corrosion-susceptible metals, or when engineers must provide protection against certain abrasive materials inside the drum, Claymont Stainless-Clad Plates are frequently specified."

In the manufacture of this CF&I-Claymont product, stainless steel claddings—in thicknesses from 5% to 50% of total plate gage—are inseparably bonded to carbon steel backing plates. Claddings are provided to ASTM A-263, A-264 and the following AISI Specifications: 304, 304L, 316, 316L, 316Cb, 321, 347, 405, 410 and 430. We also invite inquiries on other stainless specifications to meet your requirements.

Whatever the job, call Claymont when you're thinking of stainless-clad steel plate. Complete information and prompt service are yours, at the CF&I sales office nearest you.

CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates • Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Clay-Loy High Strength Low Alloy Steel Plates • Flanged and Dished Heads • Pressed Steel Shapes • Manhole Fittings, Covers and Saddles • Fabricated Steel Plate Products • Large Diameter API Pipe

Claymont Steel Products

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque · Amarillo · Billings · Boise · Butte · Denver · El Paso · Farmington (N. M.) · Ft. Worth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa · Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Tulsa · Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia

CF&I OFFICE IN CANADA: Montreal · **CANADIAN REPRESENTATIVES AT:** Calgary · Edmonton · Vancouver · Winnipeg

7132

ARE YOU READY WITH THE ANSWERS

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MAKES THE BEST PRODUCT BETTER

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When your next order involves multiple or complicated machining operations, and you've got your processing and production equipment all lined up, make sure you insure your investment by putting Threadwell cutting tools in those holders. They'll provide the uninterrupted high quality production all your machine tools are designed for.

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GREENFIELD, MASSACHUSETTS

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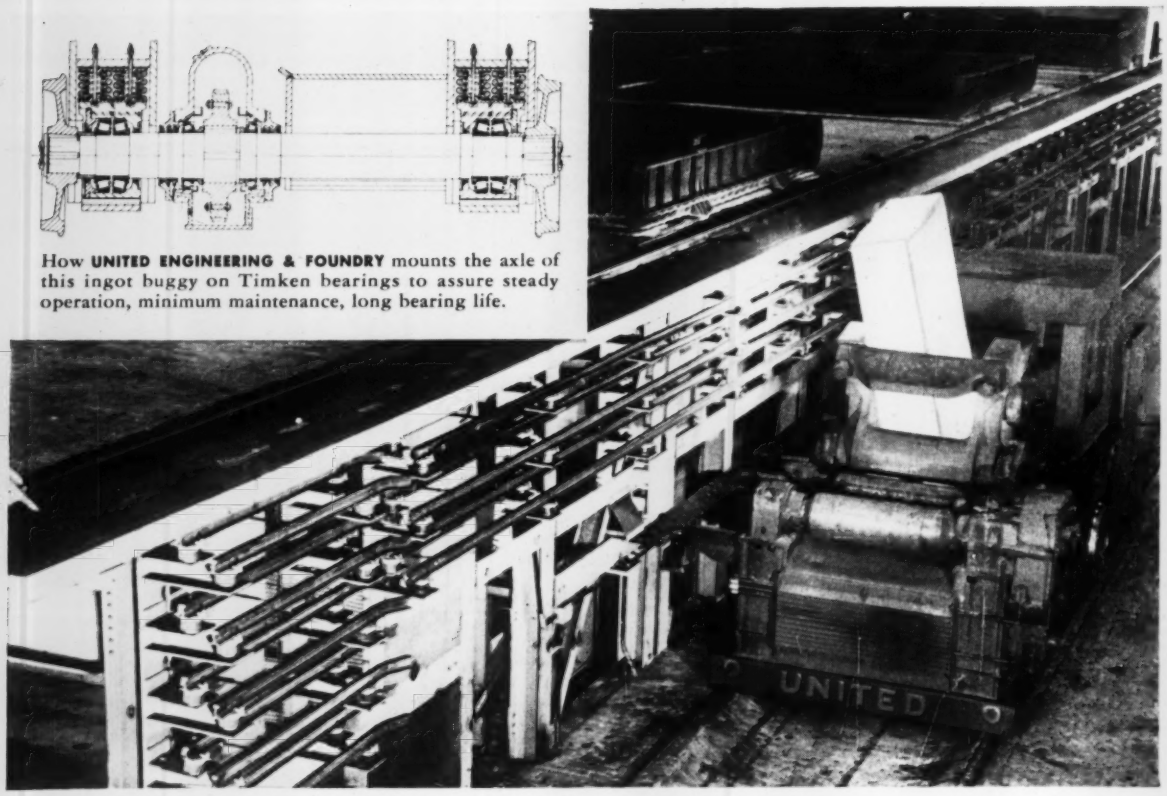
How **UNITED ENGINEERING & FOUNDRY** mounts the axle of this ingot buggy on Timken bearings to assure steady operation, minimum maintenance, long bearing life.



Keeps hot slabs moving fast with 27 Timken® bearings to keep it rolling

THIS United ingot buggy moves hot slabs and keeps 'em moving fast from a major steel producer's slab mill. To make sure the buggy moves the heavy loads steadily, with minimum maintenance, its builders, United Engineering & Foundry, equipped it with 27 Timken® *tapered* roller bearings. They're used on the axle drive worm shaft, axle journals, worm gear tilting drive worm shaft and tilting drive pinion shaft because Timken bearings:

1) *Keep shafts aligned, gears meshing accurately.* The tapered design of Timken bearings enables them to take any combination of radial and thrust loads. And full-line contact between rollers and races provides maximum stability. Cost-saving results are: shafts are held rigid; gears mesh smoothly and accurately; shaft wear is eliminated; gear wear reduced.

2) *Assure longer bearing life.* Timken bearing rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. They practically eliminate friction, roll smoother, longer.

Any machine with Timken bearings gives you *extra* benefits—the benefits of Timken Company leadership in tapered roller bearing design and in engineering service. It's leadership backed by the most modern research and development facilities in the bearing industry. To get the most out of the machines you build or buy, specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

WHEN YOU BUY TIMKEN® BEARINGS YOU GET...

1. Quality you can take for granted
2. Service you can't get anywhere else
3. The best-known name in bearings
4. Pace setter in lower bearing costs

BETTER-NESS rolls on

TIMKEN®

First in bearings for 60 years

tapered roller bearings